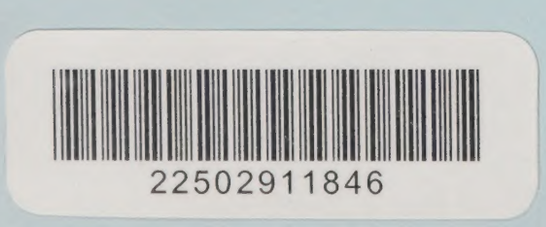
Public Health Laboratory Service

1968 YEAR BOOK

including Annual Report for 1967



CONTENTS

THE PUBLIC HEALTH LABORATORY SERVICE BOARD

It is with regret that the death of Mr. A. H. Clough, a member of the Board since its inception in 1961, is reported. He was succeeded by Mr. F. A. Adams, late Under-Secretary for Finance and Accountant General of the Ministry of Health.

Dr. J. Stevenson Logan and Professor R. E. O. Williams retired from the Board on 31st July, 1967, and Professor A. W. Downie on 31st July, 1968. The new members are Dr. J. B. Meredith Davies, Deputy Medical Officer, City of Liverpool; Professor R. Knox, Professor of Bacteriology, University of London, at Guy's Hospital Medical School; and Professor K. McCarthy, Professor of Bacteriology, University of Liverpool.

The present membership of the Board is set out on page iii.

THE PUBLIC HEALTH LABORATORY SERVICE BOARD

AS AT 1ST OCTOBER, 1968

Chairman: E. T. C. Spooner, C.M.G., M.D., F.R.C.P.
(Dean, London School of Hygiene and Tropical Medicine, London, W.C.1)

Members: F. A. Adams, C.B.
(late Under-Secretary for Finance and Accountant General, Ministry of Health)

Professor A. C. Cunliffe, M.D., F.C.Path.
(Professor of Bacteriology, University of London, at King's College Hospital Medical School, London, S.E.5)

J. B. Meredith Davies, M.D., D.P.H.
(Deputy Medical Officer of Health, City of Liverpool)

A. A. Driver, M.D., D.P.H.
(Senior Administrative Medical Officer, Leeds Regional Hospital Board)

Professor R. Knox, M.D., F.R.C.P.
(Professor of Bacteriology, University of London, at Guy's Hospital Medical School)

Professor K. McCarthy, M.D., F.C.Path.
(Professor of Bacteriology, University of Liverpool)

J. R. McGregor, C.B., C.B.E., M.C.
(late Director of Finance, War Office)

R. M. Shaw, C.B., M.B., D.P.H.
(Deputy Chief Medical Officer, Ministry of Health)

Charles C. Stevens, LL.B.
(Member of Manchester Regional Hospital Board; Chairman, Macclesfield and District Hospital Management Committee)

J. F. Warin, M.D., D.P.H.
(Medical Officer of Health, Oxford)

G. I. Watson, O.B.E., M.D., D.T.M. & H.
(Medical Practitioner, Peaslake, Surrey)

Professor N. P. L. Wildy, M.B., M.R.C.S., F.R.S.E.
(Professor of Virology and Bacteriology, University of Birmingham)

Staff Assessors to the Board:
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.
Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H.

Secretary:
J. D. Whittaker, M.B.E.

HEADQUARTERS ADMINISTRATIVE OFFICE

24 Park Crescent, London, W1N 4DA

Tel.: Museum (STD 01-636) 2223

J. W. Howie, M.D., P.C.Path., F.R.C.P., Q.H.P. (*Director of the Service*)

J. C. Kelsey, M.D., M.C.Path., Dip.Bact. (*Deputy Director of the Service: see also* pages 27 and 33)

J. D. Whittaker, M.B.E. (*Secretary of the Board*)

R. H. Westlake (*Finance Officer and Deputy Secretary of the Board*)

S. W. H. Aust (*Accountant and Supplies Officer*)

J. W. Bushell (*Establishments Officer*)

*A. Waltho (*Officer in Charge*), MRC Central Store, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 0071

* Member of the staff of the Medical Research Council.

INTRODUCTION

ADMINISTRATION AND ORGANISATION OF THE SERVICE

The Public Health Laboratory Service is the successor of the Emergency Public Health Laboratory Service planned, organised and administered during the war years 1939–1945 by the Medical Research Council, at the request of H.M. Government. In 1945 it was decided by the Government to retain the Service on a permanent footing. Statutory authority was provided by Section 17 of the National Health Service Act, 1946, which empowered the Minister of Health to provide a " bacteriological service " for the control of the spread of infectious diseases. Later the Medical Research Council agreed to an extension of the period of their administration, with the delegation of detailed responsibility to the Public Health Laboratory Service Board appointed by them for this purpose. In 1960, however, the Public Health Laboratory Service Act, 1960, established and incorporated a new Public Health Laboratory Service Board as a statutory body capable of acting in its own right as agent for the Minister. The Act also provided for the transfer of staff of the Service from the employment of the Council to that of the Board, and the transfer of property from the Council to the Minister of Health; these transfers took effect on 1st August, 1961.

The Chairman and members of the Public Health Laboratory Service Board are appointed by the Minister of Health and, in accordance with the Schedule to the Act, the members must include the following (and must therefore be at least eight in number, in addition to the Chairman):

(*a*) not less than two persons appointed after consultation with the Medical Research Council;

(*b*) not less than two persons with experience as bacteriologists, appointed after consultation with such organisations as the Minister thinks appropriate;

(*c*) not less than two persons holding office as medical officer of health to a local authority;

(*d*) not less than one person appointed after consultation with such organisations as appear to the Minister to represent the hospital service;

(*e*) not less than one fully registered medical practitioner engaged in general medical practice, appointed after consultation with such organisations as the Minister may recognise as representative of practitioners so engaged.

The Chairman and members of the Board are normally appointed for a term of three years.

The Board exercises its functions in accordance with any directions received from the Minister of Health. In the exercise of these functions it acts as a principal.

The staff of the laboratories of the Service are appointed and employed by the Board. The directors of the constituent laboratories are whole-time medically qualified bacteriologists, with full consultant status. Professional staff are selected to a large extent from newly qualified medical graduates after they have held house appointments for 12 months or longer, they then receive five years' training in pathology and bacteriology. During the third year the trainee is required to obtain the Diploma in Bacteriology of the University of London or of the University of Manchester. The Service also receives fully trained recruits from the Hospital Service and from the universities. As a general rule, science graduates without medical qualifications are employed only in the reference laboratories (*see* page 33) where the work is of a highly specialised nature.

The technical staff of registered medical laboratory technicians are recruited from boys and girls leaving school at 16 to 17 years of age, who have attained the necessary standard of education; they go through a system of training in academic and practical subjects now becoming general in pathological laboratories throughout the country.

The development of the Service between 1946—in which year it was established in its present form—and 1967 may be summarised as follows:

	1948	1955	1962	1967
Number of Constituent Laboratories	36	56	59	62
Medical staff	84	124	132	145
Scientific staff		26	39	60
Technical, Clerical and Maintenance staff ..	562	778	956	1,170
Total specimens examined..	793,314	1,689,033	2,314,126	3,114,830

At first the material received at the laboratories consisted of sanitary specimens—milks, water, foodstuffs, etc.—and specimens of human and animal origin sent in for bacteriological examination. In 1956, however, after a field trial of the Salk poliomyelitis vaccine carried out with the help of the laboratories of the Service under the aegis of the Medical Research Council, attention was increasingly directed to the examination of specimens for virus infection. By 1958 the majority of the laboratories were able to offer the virus diagnostic service which is now general, and also to provide effective investigation and control of epidemics arising from virus infections, and to give advice about their control. In 1967 107,706 virus specimens were examined.

In the early post-war years most of the constituent laboratories were housed in temporary accommodation provided by County Councils, County Borough Councils, University departments and hospitals; a few were in huts or converted houses. However, a programme was soon established for the provision of permanent buildings, designed for their purpose, and sited conveniently for the areas served. It was decided by the Ministry of Health in 1946 that, whenever possible, public health laboratories should in future be situated in hospital compounds, as the need for the integration in the Service of public health and hospital bacteriology became generally recognised. After the Regional Hospital

Boards had come into operation, this led to the establishment of the joint public health and hospital laboratories, which have subsequently become a developing feature of the organisation of the Service. At the present time nearly all major projects for new buildings are of this nature, and the building programme is linked to that of the Ministry of Health for new hospitals.

The Central Laboratory of the Service is situated at Colindale, London, N.W.9, and contains the principal reference and specialist departments of the Service.

There are 62 constituent laboratories in England and Wales, together with three " recognised " ones (*see* page 36)—these latter being hospital pathological laboratories which undertake the examination of sanitary specimens for the Service in areas where facilities of a constituent laboratory are not available, or are available only at a long distance with considerable inconvenience. In addition, a number of consultant bacteriologists employed by Regional Hospital Boards in the Hospital Service are associated on a part-time basis with the Public Health Laboratory Service (*see* page 36).

The total of 62 constituent laboratories includes the following nine regional ones: Bristol, Cambridge, Cardiff, Leeds, Liverpool, Manchester, Newcastle upon Tyne, Oxford and Sheffield. These regional laboratories, most of which are staffed by three to five medically qualified workers, together with junior bacteriologists in course of training, act to some extent as parent laboratories to a group of area laboratories. Help is provided in the handling of special—e.g. epidemiological—enquiries, and in the provision of staff substitutes during periods of leave or illness.

SCOPE OF THE SERVICE

The function of the Service is to make a continuous study of how communicable microbial diseases are spread and what advice may be offered about their control; thus its work is essentially bacteriological, virological and epidemiological, the aim being to apply in these fields—on a national scale—the outlook and methods of a research team to the day-to-day problems of infections as they are met in ordinary life. Apart from certain tests closely associated with bacteriological and virological investigations, chemical and biochemical tests and histological examinations are not performed. Except by special arrangement the Service does not undertake work that is rightly within the province of the hospital or clinical pathologist, but it is ready to offer help when facilities for such work are not otherwise available.

All specimens must be submitted by doctors, veterinarians, dentists, public health inspectors, and others acting on behalf of medical officers of health, Government departments, or representatives of other official bodies; specimens cannot be accepted from private persons (see, however, sub-paragraph (*b*) below).

The routine specimens fall under two main heads:

(*a*) " Medical " specimens received from medical practitioners, infectious diseases hospitals and local authorities. These are specimens of sputum,

faeces, throat swabs, blood samples, etc., taken for diagnostic examination from persons suspected of suffering from infectious disease. Medical officers of health, school medical officers, general practitioners —the latter where geographically practical—and others are offered a comprehensive service for the diagnosis, treatment and prevention of bacterial, virological and mycological infections. Medical practitioners are welcomed at all times in the laboratories for the purpose of consultation.

(*b*) " Sanitary " specimens: these are received from medical officers of health, public health inspectors, and others concerned officially with the control of the public health. They comprise specimens for bacteriological examination of water, shell-fish, watercress, sewage, milk and cream; of processed foods such as ice-cream, artificial cream and canned foods; and of imported products such as the various forms of meat, fish, processed egg, coconut and fertiliser. The Service normally examines only material offered to the consumer, but will, of course, examine specimens taken at any stage of production or distribution by medical officers of health investigating suspected food-borne infections. The Service is ready to give free advice to food manufacturers and processors to assist them in the production and distribution of bacteriologically safe products. For routine control of such products, commercial firms are charged a fee, but work of this sort is undertaken only exceptionally.

The epidemiological work of the Service includes not only the investigation of outbreaks of infectious disease, in co-operation with local medical officers of health, but also studies of the distribution and behaviour of infectious agents throughout England and Wales, and of the various aspects of the immunisation programme. Epidemiological information is collected centrally week by week from public health and hospital laboratories all over the country, including Scotland, Northern Ireland and Eire and then made available to each of these laboratories in turn in the form of a confidential weekly " Communicable Diseases Report ".

Field investigations of infectious disease, and field trials of protective agents, including vaccines, are frequently carried out. All laboratories are engaged to some extent in research in addition to routine work.

A special feature of the Service is the investigation of various problems by Working Parties containing a dozen or more members drawn from laboratories in different parts of the country. Some of the problems investigated are of direct concern to Government Departments, with which close working relations have always existed.

In addition to normal public health work, an increasing number of laboratories of the Service are undertaking responsibility for clinical bacteriology at hospitals. Arrangements of this kind, involving the association of a public health laboratory with the pathological laboratory of a hospital, provide many advantages, and are frequently requested by hospital authorities. They are readily accepted on condition that there is also a need for public health laboratory facilities in the area.

Brief mention has already been made of the reference laboratories and

specialist departments. These provide facilities for the exact identification and " finger-printing " of organisms belonging to many different groups. This is sometimes required by clinicians in their treatment of patients, but more often for epidemiological purposes. The reference laboratories are open freely for use by any laboratory within or without the Service. In addition, a number of reference experts are retained for the examination of occasional specimens which require special skill, special knowledge, or special reagents.

The Service distributes various vaccines and sera on behalf of the Ministry of Health. It also provides certain reagents for diagnostic purposes, prepared by or issued from the Standards Laboratory for Serological Reagents at the Central Public Health Laboratory, Colindale Avenue, London, N.W.9 (*see* page 35).

GRANTS AND OTHER ASSISTANCE RECEIVED FOR SPECIAL INVESTIGATIONS IN 1967

The Public Health Laboratory Service Board now receive valuable assistance from the Departmental Research and Development Fund of the Ministry of Health. Allocations from this fund have enabled the Board to undertake the following important projects, involving research work of an " operational " nature:

A study of the use of a computer for the identification of bacteria.

The establishment of a special laboratory for the study and typing of mycoplasmas—this being a necessary preliminary step towards the provision by the Service of reference facilities for these organisms.

Laboratory investigations into farmers' lung.

Research into rubella and the use of gamma globulin.

An investigation of laminar flow ventilation and the determination of its effectiveness in protecting hospital patients who are at special risk to cross-infection.

Research on infectious hepatitis. The purchase of marmosets to be used in the investigation.

Grants have been received by the following individual members of the Board's staff:

(*a*) From the Medical Research Council:

Dr. I. G. Murray (Director, Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine).

Provision for research in serological methods in the classification of pathogenic fungi and in the diagnosis of mycoses.

Dr. P. G. Higgins (Virologist, Epidemiological Research Unit, Cirencester).

Provision for research into the application of organ cultures to the diagnosis and epidemiology of virus infections in the general community.

Dr. S. P. Lapage (Curator, National Collection of Type Cultures, Colindale, London).

Provision for research in the analysis of genetic material of the bacterial cell.

Dr. J. O'H. Tobin (Director, Public Health Laboratory, Manchester).

Provision for research on cytomegaloviris infections.

Dr. R. Blowers (Director, Public Health Laboratory, Middlesbrough).

Provision for research on biochemical factors controlling nose and skin carriage of staphylococcus aureus.

(*b*) From Northcott Devon Medical Foundation:

Dr. B. Moore (Director, Public Health Laboratory, Exeter).

Provision for the purchase of equipment for research and interpretation of urinary infection in hospital subjects.

The Board also receive grants from the following bodies for the assistance of special investigations and the acquisition of major equipment of a special nature:

(*a*) From the World Health Organisation:

$3,500 for the assistance of laboratory research on enteric phage-typing at the International Centre recognised at the Enteric Reference Laboratory, Colindale, London.

$3,500 for the International Shigella Centre recognised at the Dysentery Reference Laboratory, Colindale, London.

$3,000 for the International Reference Centre for Staphylococcal Phage-typing recognised at the Cross-Infection Reference Laboratory, Colindale, London.

$2,500 towards the cost of testing the specificity of virus antisera at the Standards Laboratory for Serological Reagents, Colindale, London.

$2,500 for the preparation and testing of reagents (rhinovirus), at the Virus Reference Laboratory, Colindale, London.

$3,000 towards the cost of epidemiological serological investigations of tropical sera for antibodies in treponematoses at the Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, London.

(*b*) From the Medical Research Council:

A grant of £11,698 a year for two years for a second survey into the pattern of infection in acute respiratory virus diseases, £3,370 a year being for a study in collaboration with general practitioners and £8,328 a year for a study in association with the Council of children in hospital.

(*c*) From the National Fund for Poliomyelitis and Other Crippling Diseases:

A grant of £150 for the purchase of a Rank Audio Visual Technicolour Projector, and a number of film loops, to provide the nucleus of a library at the Virus Reference Laboratory, Colindale.

In addition to the provision of research grants described above, two research projects are in progress jointly with the Medical Research Council, in which members of the Council's scientific staff are collaborating. These are as follows:

Research work on viruses at the Epidemiological Research Unit, Cirencester, Gloucestershire;

Various studies at the Cross-Infection Reference Laboratory, Colindale Avenue, London, N.W.9.

Laboratory Directors of the Service are also carrying out investigations in conjunction with general practitioners and hospital medical officers in many places, notably in the study of chronic bronchitis, of hospital cross-infection and of sterilisation and disinfection problems; on gastro-enteritis and the safety of various foods.

A clause of the Schedule of the Public Health Laboratory Service Act, 1960 permits the Board to accept, hold and administer private gifts on trust for any purpose related to the Public Health Laboratory Service or otherwise connected with bacteriological research.

REVIEW BY THE DIRECTOR OF THE SERVICE OF ACTIVITIES IN 1967

LABORATORIES

In October the Guildford Public Health Laboratory became a joint laboratory with St. Luke's Hospital Laboratory. The Laboratory at Hull moved to its new premises at the Hull Royal Infirmary, Anlaby Road on 16th June, 1967. The Laboratory at Reading moved on the 3rd August, 1967 from the Battle Hospital to the Royal Berkshire Hospital.

OBITUARY

The death on 17th November, 1967 of Dr. A. J. H. Tomlinson, Director of the Public Health Laboratory at County Hall, aged 51, is recorded with deep regret. We regret also the sudden death on 29th December, 1967, of Dr. K. E. A. Hughes, former director of the Public Health Laboratory at Portsmouth, aged 71.

RETIREMENTS AND RESIGNATIONS

Dr. Bessie H. E. Cadness Graves, Director at Watford since 1947 retired on 30th April, 1967.

Dr. S. T. Cowan, Curator of the National Collection of Type Cultures from 1947 to 1965, Administrative Director of the Central Public Health Laboratory from 1961 and Deputy Director of the Service since 1964, retired on 31st January, 1967.

Dr. H. D. Holt, Director at Luton since 1955 retired on 5th February, 1967.

Dr. Ruth C. J. James, Director of the Neasden Laboratory since 1960 transferred to a part-time appointment at the Maidstone Laboratory on 8th May, 1967.

Dr. N. Wood, Director at Reading since 1948 retired on 15th July, 1967.

APPOINTMENTS

Dr. J. V. Dadswell was appointed to succeed Dr. N. Wood as Director of the Reading Laboratory.

Dr. B. R. Eaton was appointed to succeed Dr. Bessie H. E. Cadness Graves as Director of the Watford Laboratory.

Dr. J. C. Kelsey was appointed to succeed Dr. S. T. Cowan as Director of the Central Public Health Laboratory and as Deputy Director of the Service.

Dr. A. T. Willis was appointed to succeed Dr. H. D. Holt as Director of the Luton Laboratory.

Dr. R. C. J. Hart was appointed Consultant Virologist and Deputy Director of the Exeter Public Health Laboratory.

LOCUMS

We are most grateful to the following for help with locum duties:

Dr. Bessie H. E. Cadness Graves at Watford; Dr. W. G. Henderson at Bath; Dr. H. D. Holt at Neasden; Dr. G. Kemble Welch at Stafford; Dr. R. Norton at Sunderland; Dr. Herta Schwabacher at Watford; and Dr. R. L. Vollum at Taunton.

SECONDMENTS ABROAD

Dr. R. Blowers accepted an invitation for a temporary appointment to the Chair of Microbiology at Makerere University College, Uganda. His secondment will be for two years. Dr. C. S. Goodwin was seconded to the Ethiopian Leprosy Mission for a period of two years.

VISITS ABROAD

By invitation of the Microbiological Society of Israel, Dr. E. S. Anderson went to Israel to participate in a Commemoration Symposium in memory of the late Dr. A. Felix, a member of the staff of the Service from 1939 to 1954. Dr. Anderson also visited Vienna to participate in a colloquium on " Extrachromosomal mechanisms of resistance to Antibiotics ".

Dr. Yvonne E. Cossart visited Centres in Chicago, Detroit, Atlanta, and Yale to study tissue culture and marmoset transmission experiments concerned with infectious hepatitis.

Dr. Betty C. Hobbs was invited to go to Bilhoven, Holland, by the World Association of Veterinary Food Hygienists to take part in a Round Table discussion on " Special Problems in the Field of Food Hygiene with Particular Reference to Contamination of Foods ". Dr. Hobbs also accepted an invitation by the World Health Organisation to visit Geneva to attend a meeting of the World Health Organisation Expert Committee on Food Hygiene (food microbiology). The World Health Organisation invited her to visit New Delhi to attend a World Health Organisation Seminar on Food-borne Diseases and Intoxications, and Food Hygiene Practices. By invitation of the Institute of Microbiology and Hygiene, University of Montreal, Dr. Hobbs went to Montreal to attend " Workshop on the Anaerobic Bacteria ". She attended a meeting in Vienna of the Panel on Microbiological Standards and Testing Methods for irradiated Food by invitation of the Food and Agriculture Organisation of the United Nations and International Atomic Energy Agency.

Dr. J. W. Howie visited the Pakistan-SEATO Cholera Research Laboratory in Dacca, East Pakistan to attend a meeting of the Technical Committee as British Representative. From there he visited Sydney, Australia at the invitation of the New South Wales Department of Medical Research and Public Health to advise on the organisation of a Public Health Laboratory Service. In March he visited Makerere University College as external examiner, and addressed the

Uganda Medical Association. Dr. Howie accepted an invitation from the World Health Organisation to visit Geneva in May to advise the World Health Organisation Health Laboratory Services Division in the compilation of a questionnaire on the definition, recruitment, and training of microbiologists. In November he visited the Communicable Diseases Centre in Atlanta and the National Institutes of Health in Bethesda. Dr. Howie then returned to Dacca, East Pakistan to attend as British Representative a further meeting of the Technical Committee of the Pakistan-SEATO Cholera Research Laboratory.

Dr. L. Hoyle visited Germany and saw Professor Rott and his colleagues at the Institute of Virology, University of Geissen and Professor Schafer of the Max Planck Institute, Tubigen to discuss recent studies of influenza virus chemistry with particular reference to the chemistry of the virus neuraminidase.

Dr. N. S. Mair accepted an invitation of the International Association of Microbiological Societies to read a paper at a Symposium on "*Pasteurella pseudotuberculosis* and *Yersinia enterocolitica*" at the Institut Pasteur, in Paris.

Dr. I. G. Murray accepted an invitation from the Ciba Foundation to read a paper at a symposium on mycosis at Ibadan, Nigeria.

Mr. R. J. Owen visited Marseilles to attend a Summer School on Nucleic Acids organised by the Federation of European Biochemical Societies.

Dr. M. T. Parker visited Prague to meet Dr. J. Rotta, Director of the World Health Organisation International Centre for Streptococcal typing at the State Institute of Epidemiology and Microbiology. He also accepted an invitation from the World Health Organisation to go to Prague and Geneva to give advice about the formation of an expert committee on coccal infections. He also visited Trinidad in connection with the investigation of streptococcal infections.

Dr. C. E. D. Taylor, Dr. W. D. Brighton and Dr. A. H. Tomlinson went to Florence by invitation of Dr. E. J. Holborow of the Medical Research Council's Rheumatism Research Unit to attend a meeting on the Standardisation of Immunofluorescent Reagents to be held at the Institute of Special Medical Pathology and Clinical Methology University of Florence.

Dr. Joan Taylor was invited to Stockholm by the Veterinary Medical Centre there to lecture and to give instruction on a specialised technique.

VISITING WORKERS

Many visitors spent periods at the Laboratories at Colindale, Carmarthen, the Epidemiological Research Unit, Guildford, Leeds, Leicester, the Leptospirosis Reference Laboratory, Liverpool, Manchester, Middlesbrough, Newcastle, Northallerton, Stafford, Swansea, the Tuberculosis Reference Laboratory, and at the Venereal Diseases Reference Laboratory.

ROUTINE WORK OF THE SERVICE

In 1967, the 62 regional and area laboratories of the Service examined 3,114,830 specimens. Of these 107,706 were virological specimens. As before

the work came from hospitals, local health authorities, general medical practitioners, and veterinarians. Not surprisingly, as more of our laboratories accept responsibility for hospital diagnostic work the proportion of work from this source increases. This may be welcomed as long as the Service is able to use its hospital contacts as an effective means of ascertaining what infective agents are abroad and are active in the community without becoming so burdened by its hospital commitment that it is unable to devote itself as it must, to learning more about how microbes are spread around and how they may best be controlled. So far, the Service continues to be active in this, its proper field; but it is necessary all the time to watch carefully that hospital demands do not cause too great a diversion of resources from epidemiological studies. As yet there is no evidence that this has happened with our Service; and we intend to be sure that it does not.

SCIENTIFIC WORK

Outbreak of Coxsackie B5 Virus Infections during 1965. In December 1967, the Service published a useful piece of work, which it is difficult to imagine being able to be done by any other organisation. Under the stimulus of Dr. A. J. H. Tomlinson, whose untimely death on 17th November, 1967 was a sad and serious loss, 54 laboratories (not all of them within the Service) co-operated to ascertain the extent and character of a Coxsackie B5 epidemic during 1965. The results were analysed and reported by Mr. John G. Pope and Dr. T. M. Pollock.

In short, an outbreak of substantial dimensions was revealed. But it might easily have been overlooked altogether without a planned and concerted inquiry. The outbreak was widespread; it came in the summer months; and the patients suffered from respiratory symptoms, meningitis, myalgia, and gastro-intestinal disturbances. Children were especially susceptible. Altogether 1,160 Coxsackie B5 infections were reported to Colindale, compared with 467 in 1960, 46 in 1961, 10 in 1962, 26 in 1963, and 104 in 1964.

Reference

Public Health Laboratory Service: " Coxsackie B5 Virus Infections during 1965." *Brit. med. J.* 9th December, 1967, **4**, 575–577.

Fusiformis in Brain Abscesses. The routine work of a laboratory results in numerous subjects worthy of further investigation and provides constant stimulation to workers. In the Newcastle laboratory, for example, it was noticed that many samples of pus from brain abscesses and abdominal lesions, sterile after 24 hours of culture, yielded growths of *Fusiformis* on prolonged anaerobic incubation. Thirty-five strains isolated, all identified as *F. fragilis*, were found sensitive to erythromycin, lincomycin, chloramphenicol, and tetracycline, and resistant to penicillin, polymyxin, streptomycin, and neomycin. As erythromycin and lincomycin were bactericidal at 2–4 × the minimal inhibitory concentration, it is suggested that these are the drugs of choice in the treatment of such conditions. Although erythromycin was used with success some strains developed resistance on serial passage in the presence of this drug. Similar resistance failed to develop against lincomycin and this may therefore be the preferable antibiotic for treatment.[1]

Although previous reports have suggested that the commonest *Fusiformis*

involved in human infection is *F. necrophorus*, for which penicillin would be the drug of choice, this investigation indicated that *F. fragilis* is more commonly associated with human infection, a finding in accordance with that published by Gillespie in 1956,[2] who isolated some 111 strains of *Fusiformis* from abdominal sepsis most of which were resistant to penicillin and although not identified by the author were subsequently referred to as *F. fragilis* in the 5th Edition of Topley and Wilson.[3]

References

1. Ingham, H. R., Selkon, J. B., Codd, A. A., Hale, J. H.: " The sensitivity to antibiotics of a species of *Bacteroides* encountered in human infection." *J. clin. Path.* (In press.)
2. Gillespie, W. A., and Guy, J.: " *Bacteroides* in Intra-abdominal Sepsis: Their Sensitivity to Antibiotics." *Lancet*, 1956, **i**, 1039.
3. Topley and Wilson: " Principles of Bacteriology and Immunology." 5th Edition, p. 2144.

Chemistry of the Influenza Viruses. Studies of the chemical reactions involved in the union of influenza virus with the host cell and in the release of virus after intracellular reproduction are of importance because of the possibility that a chemotherapeutic attack on the virus might be made at these points in the growth cycle.

Initial union of virus and cell is a result of chemical union between virus haemagglutinin and mucoprotein cell receptor substance, while enzymic destruction of cell receptor by the virus neuraminidase appears to be involved in the process of virus release from the cell. While many studies have been made of the chemical structure of the cell receptor substances there has been little work on the chemistry of the active centres of the virus haemagglutinin and neuraminidase. Although these activities are very closely related they are not necessarily due to the action of a single active centre in the virus protein. By digestion with proteolytic enzymes such as trypsin and pronase, neuraminidase may be separated from heamogglutinin in some strains of virus, the enzyme being released as a protein of small molecular weight. This suggests the presence of separate active centres at different points in a large protein molecule. With the Lee virus neuraminidase may be released by treatment with dodecyl sulphate and in this case the activities may reside in two different protein molecules.

In Northampton attempts have been made to identify the amino acid residues in the virus protein responsible for haemagglutinating and enzymic activity by treatment of the virus with reagents acting on the chemically reactive groups in the protein molecule. It was found that the properties were unaffected by reagents acting on sulphydryl or amino groups, the thiomethyl ether group or the indole ring. Reagents acting on carboxyl groups precipitated the virus and destroyed all properties but there was no evidence of a specific attack on the active centres. The haemagglutinating neuraminidase activities of the virus were reduced or totally destroyed by agents acting on the aromatic rings of tyrosine and histidine or on the phenolic hydroxyl group of tyrosine and the imino group of histidine, by agents reacting with amide or guanidyl groups, and by agents acting on the disulphide bond. In general all reagents destroying haemagglutinin also destroyed neuraminidase, but several reagents inactivated neuraminidase without loss of haemagglutinating power.

Results with the DSP strain of virus A and the Lee strain of virus B indicated the presence of active centres containing an amide group and one or both of the amino acids histidine and tyrosine, maintained in suitable steric relation by disulphide linkages. The chemical reactions of the two strains of virus were different and suggested the presence of two active centres in the DSP strain, one containing histidine and one tyrosine. Both centres were involved in haemagglutination but only one appeared to have neuraminidase activity. The Lee strain also appeared to have two centres, both showing neuraminidase activity but only one causing haemagglutination.

Studies are now being extended to a larger range of influenza virus strains and it has been found that there are striking chemical differences between A, A1 and A2 viruses, indicating the presence of active centres of different configuration. Some strains appear to contain only one active centre while others have two or more. The chemical reactions of the phenolic hydroxyl group of tyrosine are very similar to those of the imino group of histidine and it seems possible that histidine and tyrosine are interchangeable, some active centres containing one and some the other. Different strains of virus also differ in susceptibility to agents acting on disulphide or hydrogen bonds which may be responsible for maintaining the steric configuration of the active centres.

The results afford yet another example of the great variability in the surface proteins of the influenza viruses.

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The Bacteriology of Fresh Cream. Strict regulations and standards are enforced in the sale of milk, but no such requirements are made for the sale of cream. Under the Milk (General) Regulations 1959, milk is defined so as to include cream; in practice this means that premises where it is prepared or sold must be registered by the local authority and the standards of these Regulations in respect of buildings and cleanliness of premises must apply. Neither under the 1959 Regulations, however, nor under the Milk (Special Designation) Regulations 1963, is a licence required to sell cream; nor are there any tests which cream must pass. Cream sales have increased considerably in recent years; in 1964–65 approximately 83 million gallons of milk (4·5 per cent of the national yield) was used to make cream; it is not surprising therefore that this commodity—sold so widely, so liable to contamination, yet exempt from statutory control—has engaged the attention of some bacteriologists in the P.H.LS.

In 1958, a P.H.L.S. working party after examining 443 raw and 1,016 heat-treated retailed cream samples concluded that most of the samples were of poor bacteriological quality.[1] Seventy-seven per cent of raw creams and 50 per cent of heat-treated creams contained coliform organisms in 0·1 g; 36 per cent and 15 per cent contained faecal coli in 0·1 g. Since approximately 70 per cent of the samples had been heat-treated the results pointed to post-heating contamination.

A study from the Worcester Public Health Laboratory (1966) provided somewhat similar results.[2] Of 575 samples of fresh cream, 60 per cent contained

coliform organisms in 0·1 g and 14 per cent contained faecal strains. Since all but 34 of the samples were heat-treated the results pointed even more conclusively to post-heating contamination. Some of the bacteriological counts were very high. No fewer than 137 samples had counts of more than one million organisms per g. *Brucella abortus* was cultured from three samples of unheated fresh cream.

The Truro Public Health Laboratory is about to publish findings after examining 1,161 samples of fresh cream or cream products.[3] Of 916 clotted creams 39·3 per cent contained coliform organisms in 0·1 ml and 18·8 per cent faecal coli in 0·1 ml. Of 245 samples of fresh cream 31·8 per cent had coliforms in 0·1 ml and 27·3 per cent had faecal coli. All except 29 of the samples had received some kind of heat-treatment. In addition *B. abortus* was isolated from five samples of clotted cream.

Interim results are also available from a bacteriological study of fresh cream undertaken jointly by the Public Health Laboratories of Birmingham, Gloucester, Truro and Worcester.[4] Of 474 creams so far examined 44·3 per cent contained coliform organisms in 0·1 g and 21 per cent contained faecal coli. In addition 150 creams were examined in one of the laboratories in an attempt to identify the organisms present in each cream. No fewer than 13 samples were found to contain organisms usually associated with the human nose and throat.

An interesting feature of all these investigations is the relation between the results of coliform tests and those of the methylene blue test when it is applied to cream. Of 1926 creams in all the investigations, 1,001 (52 per cent) decolourized methylene blue in " 0 " hours, *i.e.* failed the test. Of these 1,001 creams, 75 per cent had coliforms in 0·1 g and 36 per cent had faecal strains. The remaining 925 (47 per cent) creams failed to decolourize the methylene blue in 4 to 4½ hours, *i.e.* passed the test. Of these only 13 per cent had coliforms in 0·1 g and 3 per cent had faecal coli in 0·1 g. The methylene blue test, therefore, which is cheap and easy to carry out, could obviously be used as a simple clearance test for the hygienic quality of fresh cream, or as a preliminary to more searching examination.

All four investigations disclose a high degree of contamination of fresh cream with coliform organisms probably due to careless handling. That coliforms are present is disturbing in itself, but it is even more so when one considers that when faecal coliforms are present there is a danger that pathogenic organisms such as salmonellas may also be present. That the trade is concerned is evident by the recent publication of a code of practice for the manufacture of fresh cream. It is a pity that there is no suggestion in it of a standard. In Canada and Northern Ireland heat-treated cream must not contain coliforms in 1 g.

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Diagnosis of Smallpox. Despite mass eradication campaigns against smallpox in many of the endemic areas of the world and an insistence that travellers from such areas should hold valid international vaccination certificates the disease periodically reappears in this country. In persons with suspicious vesiculating skin rashes the value of laboratory tests in establishing or excluding a diagnosis of smallpox is well established. Over the past 21 years such tests have been continuously provided by the Department of Bacteriology, University of Liverpool and by the Virus Reference Laboratory, Public Health Laboratory Service. More recently other laboratories have taken part and now the Public Health Laboratories at Bristol, Cardiff, Leeds, Newcastle, and Portsmouth, and the Department of Virology, University of Birmingham also accept responsibility for smallpox diagnosis.

Because of the circumstances which surround any suspicion of smallpox in a community there is always a demand for rapid reports of the laboratory tests. Fortunately, this subgroup of the pox-viruses, which includes the variola major and minor, vaccinia and cowpox viruses, has characters which match the situation. The virus particles, which are large enough to be visible by light microscopy, are usually present in exudates from skin surfaces in sufficient numbers so that they may be seen not only by the relatively simple staining procedure which was at one time regarded as the hall-mark of diagnostic acumen but also by the recent sophisticated method of visualisation by negative staining in the electron microscope. They multiply readily on the chorioallantoic membrane of the fertile hen's egg producing distinctive pocks which serve as markers. This method of culture has not been surpassed by later tissue culture techniques. These have the disadvantage that it is difficult to differentiate the viruses by neutralisation because of their close antigenic relationship. Additionally, in the exudates there may also be virus-derived protein which will act as antigen for gel diffusion, complement-fixation, and haemagglutination tests.

Arrangements for laboratory examination of material from patients with suspected smallpox depend on co-operation between clinician and virologist. The former examines the case, generally collects the specimens, and sends them to the laboratory by the quickest means possible. In many instances this is done merely as a precaution but on occasion an atypical illness with its underlying problem of contacts at risk creates pressure for a rapid preliminary report. In its turn the laboratory can act only after it has received a specimen and the value of its report rests on the amount and the suitability of the material provided.

The few positive smallpox results from the considerable number of specimens examined each year make reasonable grounds for limiting smallpox investigation to laboratories each capable of serving a defined region. All such laboratories must maintain both their skill at the necessary techniques and the essential but expensive turnover of fertile hens' eggs.

Arising from the extensive outbreak of variola minor in the Midlands in 1966[1, 2] the usefulness of the electron miscroscope in providing a rapid preliminary answer[3] has now become firmly established in this country. This is based not only on its capacity to provide direct visual evidence of poxvirus particles

should this be the disease in question but also on its ability to eliminate a diagnosis of smallpox when particles of a different appearance, for example, those of the herpesvirus group which cause chickenpox, are found. It should again be emphasised that neither the electron microscope nor the gel diffusion technique will distinguish between the related viruses, smallpox and vaccinia, nor does a negative preliminary result entirely suppress the diagnosis. Caution is still necessary until the results of the more sensitive egg culture tests are available.

Laboratories accepting responsibility for the diagnosis of smallpox now have electron microscopes or have access to instruments in nearby university or hospital departments. This may well mark the beginning of an advance in the more rapid diagnosis of virus diseases.

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Pasteurella pseudotuberculosis infection in Great Britain 1959–1967. The commonest manifestation of human infection with *Pasteurella pseudotuberculosis* is acute mesenteric lymphadenitis, a condition clinically often indistinguishable from acute appendicitis. It shows a predilection for children and young adults and is more often observed in males than females. The diagnosis may rest upon the isolation of the organism from the lymph nodes, blood, or faeces, histological examination of the lymph node; demonstration of specific antibodies in the serum during the acute phase of the illness; and the response to a skin-test antigen. Occasionally in adults the disease assumes a septic form with typhoidal symptoms and a high case-mortality rate, the diagnosis being made at autopsy when the organism is isolated from multiple abscesses in the liver.

The first human infections with *P. pseudotuberculosis* were recognised in Great Britain in 1959 when 3 of 17 consecutive cases of acute mesenteric adenitis studied at the Leicester public health laboratory were found to be infected with the organism (Mair *et al.*, 1960). Since then, with the co-operation of pathologists in many parts of the country, the Leicester laboratory has examined sera from 770 patients for agglutinins to the five serotypes of *P. pseudotuberculosis*. It is evident from the results that the disease is not infrequent in this country. One hundred and two patients showed serological evidence of infection; 84 were of the pseudo-appendicular form confirmed at operation, and 18 presented with indefinite abdominal symptoms which did not warrant operation. Typical histological changes in the lymph nodes were observed in 57 cases; the causal organism was isolated from the lymph nodes in 12 cases and from the faeces in 2 cases; 7 patients reacted strongly to the skin-test antigen. Type I infections accounted for three-quarters of the cases, Type II for one-fifth, and Types III and IV for the remainder. No Type V infection was recorded.

The majority of cases were recognised as mesenteric adenitis at operation but

difficulty in diagnosis was experienced with 16 patients in whom there was gross infiltration of the terminal ileum and caecum as well as massive enlargement of the mesenteric glands. Six cases were mistaken for malignant disease, 3 for early Crohn's disease, 3 for tuberculosis, 3 for Hodgkin's disease, and 1 for non-tuberculous granuloma. Four patients underwent hemicolectomy for suspected malignant disease.

The first case in this country of pseudotuberculous septicaemia was observed in 1965. The patient, a publican suffering from hepatic cirrhosis, had been bitten by his dog which showed serological evidence of infection (Macaulay *et al.*, 1967).

Infection in family contacts was noted in two of three families investigated. Agglutinins to *P. pseudotuberculosis* were demonstrated in three dogs associated with human cases. There is suggestive evidence that animals play some part in the transfer of *P. pseudotuberculosis* to young children in contact with them. This is of some importance in view of the widespread distribution of *P. pseudotuberculosis* among animals in Great Britain. Though rodents and birds are the principal reservoirs of infection, almost any species of animal, even the most susceptible, may act as a carrier of *P. pseudotuberculosis*. Of 169 strains of animal origin isolated in Great Britain during the years 1961–1964, 53 were isolated from farm animals and domestic pets, 43 from experimental animals, 38 from free-living species and 35 from wild animals living in captivity. In all, 104 strains were isolated from 12 species of mammals and 65 strains from 26 species of birds. The majority of strains belonged to serological Type 1, the type most often found in man (Mair, 1965).

Recently Mair and his colleagues (1967) reported the isolation of *P. pseudotuberculosis* from two cats which died of a wasting illness. Pseudotuberculosis of the cat has not been recognised before in this country though it is by no means rare on the Continent. Its epidemiological importance lies in the fact that the domestic cat, which has been implicated in a number of human cases, provides an obvious link between its owner and the rodent and avian reservoirs of *P. pseudotuberculosis*.

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Toxoplasmosis. *Toxoplasma gondii* is perhaps the commonest protozoon to produce human infection in Britain. It is a crescentic parasite, about 6 μ long, multiplying intracellularly in various tissues and not usually causing symptoms. It may persist indefinitely in the tissues in the encysted state. The frequency of infection in the population is indicated by the fact that although specific antibodies are found in the sera of less than 1 per cent of children aged 1 year, they are found in 30–40 per cent in adults.

It is still uncertain how man acquires infection. Toxoplasma has been found in all types of livestock and in pets, and antibodies tend to be commoner in rural populations and handlers of animals. There is still little good evidence that meat can infect man, but in France Desmonts *et al.* (1965) showed that feeding raw mutton to children in hospital increased the incidence of toxoplasma antibodies in their sera. In India, on the other hand, antibodies were found equally in meat-eaters and vegetarians. Recently Hutchison (1965, 1967) showed that after toxoplasma cysts are ingested by a cat infested by *Toxocara cati*, the ova of the worm carry toxoplasma. Even after being kept in water at room temperature for several months, the ova are able to produce toxoplasma infection if fed to a second cat. This mode of transmission is unlikely to be common to man, but this type of cycle, perhaps involving other vertebrates and other helminths, may be important in transmission between animals.

Toxoplasma infection is usually symptomless, or the symptoms are mild or insignificant; but occasionally a more distinctive clinical condition develops. The one most commonly recognised is a chronic general lymphadenopathy, sometimes ushered in by an acute upper respiratory tract infection. The glands may not be greatly enlarged, but sometimes the enlargement is sufficient to arouse suspicion of malignancy or Hodgkin's disease. However, these conditions may also be found co-existing with toxoplasmosis. Toxoplasma lymphadenopathy often clinically resembles infectious mononucleosis. According to Beattie 7 per cent of cases of glandular fever with a negative Paul-Bunnell test are due to toxoplasma. Glandular infection is being recognised more frequently now that pathologists are becoming more familiar with the histology of affected glands. Toxoplasma is also commonly a cause of retino-choroiditis (observed in 1 per cent of acquired infections) and rarely of atypical pneumonia, encephalitis, and probably myocarditis.

Congenital infection is a special form of toxoplasmosis. After infection of the mother during pregnancy the foetus may acquire the infection and be stillborn or born with an encephalitis or generalised infection, or with other pathological changes of which a retino-choroiditis (observed in over 90 per cent of congenital infections) is the commonest. More commonly the child is born apparently normal, but later a retinal lesion is found or symptoms develop of cerebral involvement, such as paralyses or fits. Some German workers claim that toxoplasma endometritis is a common cause of stillbirths and abortion but this has so far not been confirmed by other workers.

As the lesions in toxoplasmosis are clinically so variable and so uncharacteristic, diagnosis depends on isolation of the parasite or the demonstration of specific antibody production. Isolation methods involve the inoculation of mice, require a period of weeks to provide an answer, and may give negative results in proved cases. The Sabin-Feldman dye test—the serological test routinely used in this country—is a sensitive and reliable test for toxoplasma antibodies, but as it is laborious and requires an experienced staff it is performed in only three laboratories of the P.H.L.S. (Dr. Fleck, Tooting Laboratory, for the London area; Dr. Kwantes, Swansea Laboratory, for the South and West; Dr. Ludlam, Leeds Laboratory, for the North and East). The most satisfactory serological proof of infection is the demonstration of a fourfold rise in the antibody titre, but owing to the variable clinical picture specimens of blood are

seldom collected early in the disease. As titres of 1/128 are not uncommon in adults significance may rightly be attached only to the results with single specimens if titres of 1/512 or higher are observed, but even titres of that high order have been found, although rarely, in healthy persons. Complement-fixation tests have been in use for some years but their sensitivity varies with the type of antigen used. Other tests have been developed more recently, e.g. a haemagglutination test (Jacobs and Lunde, 1957), an agglutination test with a purified suspension of toxoplasma (Fulton and Turk, 1959), and results correlating well with the dye test were reported by Fletcher (1965), who used fluorescent antibody techniques. Although these various tests do not appear to be of any greater diagnostic value than the dye test, it is hoped that one may eventually be found which is technically simpler, so that it will then be practicable for routine diagnostic laboratories to carry out their own tests.

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Identification of Cholera Vibrios. High-speed intercontinental air travel has increased the risks of the importation of infectious diseases not normally encountered in Britain. It is essential to be alert to the possibility of an exotic or non-indigenous infection in patients recently arrived from abroad. Cholera is an example of such a disease. However, with the social conditions and sanitary standards prevailing in Britain today, cholera is very unlikely to spread beyond the patient's most immediate contacts.

The term " cholera " now includes infections caused by both the " classical " *Vibrio cholerae* and the El Tor vibrio, because the disease caused by each of these two organisms is clinically indistinguishable. Since about 1961 cholera recognised as due to the El Tor vibrio has increased and shown a rapid spread into countries not previously infected (Mukerjee, *et al.*, *Brit. med. J.*, 1965, **ii**, 837), and this has led to much new research on its epidemiology, treatment, and control. The symptoms may range from the classical picture of intense vomiting, purging, dehydration and collapse to a milder syndrome of diarrhoea and vomiting not easily distinguished clinically from salmonella and shigella infections, and it is the milder type of cholera which is most likely to be missed if its possibility is not thought of by the bacteriologist.

McRobert (*Brit. med. J.*, 1967, **i**, 364) asked if Britain was prepared for cholera and an outline of the plans of the Public Health Laboratory Service in this respect was given in *Brit. med. J.*, 1967, **ii**, 496. The P.H.L.S. Memorandum on the isolation and identification of cholera vibrios, designed for bacteriologists in Britain, was recently revised (Carpenter, *Mon. Bull. Minist. Hlth Publ. Hlth Lab. Serv.*, 1966, **25**, 58) and reprints of this are available, if necessary, for any

bacteriologist outside the Service. It is recommended that experience should be gained of the media and methods before an emergency arises.

Isolation is done by enrichment in alkaline peptone water and plating on a selective medium such as Aronson's or Oxoid Cholera Medium, the latter having the advantage of being dehydrated and quickly prepared when the need arises. Rapid identification is based on positive agglutination in polyvalent *V. cholerae* serum supplemented by biochemical tests, primarily a positive oxidase reaction and the fermentation of sucrose and mannose but not arabinose (Heiberg biogroup 1), and the typical appearance of darting motility in a hanging drop preparation.

Subdivision of cholera vibrios into the serotypes Inaba or Ogawa and into the biotypes of " classical " vibrio or El Tor vibrio is not of diagnostic importance. It is mainly of value for epidemiological purposes, and as some of the tests are experimental they are best done centrally.

We are not yet clear about the exact role of other vibrios in diarrhoeal syndromes—the so-called NAG (non-agglutinable) or NCV (non-cholera vibrio) which do not agglutinate in diagnostic *V. cholerae* serum—but a recent food-poisoning outbreak in Europe was almost certainly caused by an NCV. Using a limited number of biochemical tests these vibrios are not easily differentiated from other oxidase-positive, fermentative, polarly flagellate, Gram-negative rods of the genera *Aeromonas* and *Plesiomonas*, the significance of which as causes of diarrhoea is also undetermined. Precise identification of these organisms as outlined by Carpenter *et al.* (in *Identification Methods for Microbiologists*, 1968, page 9, Academic Press, London) may help in elucidating the enigma of diarrhoea from which currently accepted pathogens are not isolated.

Progress in Immunofluorescence Techniques. In spite of much published advice about the applications of immunofluorescence in microbiology and other fields, individual workers continue to experience difficulty in obtaining satisfactory and reproducible results. Evidently the difficulty is often caused by the use of impure or otherwise unsuitable reagents and of inadequate optical equipment. Mainly in efforts to establish useful immunofluorescence techniques which might aid in the rapid diagnosis of microbial diseases, several members of the P.H.L.S. have taken a keen interest in trying to overcome many of the problems involved.

It was evident from the report of a P.H.L.S. Study Group set up in 1965 (including work described in more detail by Brighton (1966) that there was great variability in the purity and performance of different batches of commercially available reagents, as well as in the efficiency of optical equipment. The findings pointed to an urgent need for standardisation of reagents and for considerable improvement in the optical equipment then commercially available. One set of equipment tested by the Working Party, and found to have particular promise, was at that time only an experimental prototype in the course of development at Colindale. This has since been developed further (Lidwell *et al.* 1967) and is now commercially available. It incorporates a 100 watt high pressure mercury vapour arc and is proving to be superior in many ways to more expensive models.

Although it is very much cheaper and easier to use than a high pressure

mercury vapour arc, the Study Group did not report favourably on the use of an iodine quartz lamp for immunofluorescence. This was mainly because at that time there were serious problems in relation to the suitability of optical filters available. Tomlinson (1967) overcame many of these difficulties but further experience in the use of the lamp is required before it can be generally recommended for routine purposes.

Mainly as a result of work by Brighton (1966), the purchase and testing of reagents for immunofluorescence in the P.H.L.S. are now undertaken by the Standards Laboratory for Serological Reagents. This valuable service is greatly appreciated by workers in the P.H.L.S. as it means that a reliable source of reagents is readily available. Furthermore, it obviates the need for individual workers to spend time making reagents themselves or purchasing and testing commercially available reagents, and should lead to considerable economy by preventing money from being spent on expensive but inferior and often useless materials.

In an effort to assist manufacturers in the preparation of suitable conjugates, Brighton *et al.* (1967) published a provisional specification for fluorescein-labelled antibody against human globulin (IgG). This was written after seeking the views of other workers in the United Kingdom and abroad, as well as after discussions with representatives from several commercial firms.

In September 1967, W. D. Brighton, A. H. Tomlinson and C. E. D. Taylor were invited to read papers and participate in International Workshop on Standardisation in Immunofluorescence, held in Florence under the auspices of the National Research Council (Italy) and the World Health Organisation. The two chief topics considered at this meeting were optical equipment and reagents. The proceedings have not yet been published but there was general agreement on the need for standardisation of reagents for immunofluorescence. It is likely that, as a result of the valuable exchange of information and opinions at the Workshop in Florence, efforts will be made to produce an internationally acceptable specification for immunofluorescence reagents. The provisional specification of Brighton *et al.*, together with a similar one published almost simultaneously by Beutner *et al.* (1967), may well form a useful basis for this.

The Medical Research Council is also interested in the need for standardisation of reagents for immunofluorescence, and there is close collaboration between representatives of the P.H.L.S. and the M.R.C. on this subject.

In the Venereal Diseases Reference Laboratory work is in progress on the absorbed fluorescent treponemal antibody (FTA) test which is likely to replace the FTA 200 test. A fluorescent antibody method for detecting *Treponema pallidum* in ocular syphilis and neurosyphilis is also under investigation. A study of the FTA inhibition test has been described by Wilkinson (1967).

A chapter on fluorescent antibody techniques by G. V. Heimer was published in *Progress in Microbiological Techniques* (1967) edited by C. H. Collins.

In December 1967, Mr. Heimer visited laboratories in Holland to see and discuss optical equipment being developed there for immunofluorescence, as

well as to study the application of immunofluorescence to the rapid diagnosis of acute respiratory virus diseases.

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The Communicable Disease Report. One of the functions of the Public Health Laboratory Service is the collection of current findings from diagnostic laboratories and the prompt dissemination of this information to microbiologists throughout the United Kingdom.

Each contributing laboratory makes a weekly report of certain infections identified during the previous seven days and these reports are compiled by the Epidemiological Research Laboratory and circulated throughout the Service. Workers in all laboratories are thus kept aware of the organisms responsible for current disease, of the appearance of new or unusual infections, and of the appearance of outbreaks.

The number of laboratories without the Service which contribute reports has continuously increased and the combined weekly report is now circulated to about 500 laboratories in the United Kingdom and the Republic of Ireland, to the World Health Organisation, and to the appropriate authorities in the United States of America.

Until May this year the combined laboratory report was known as The Weekly Summary and consisted in the main of a simple alphabetical list of infections. This had the disadvantage that the epidemiological significance of the findings could not be easily assessed or analysed, and in recent years it became increasingly evident that changes were required. A P.H.L.S. Working Party which examined the position recommended major alterations and in May the Weekly Summary was replaced by the Communicable Disease Report.

The Communicable Disease Report differs considerably from the Weekly Summary. The laboratory reports are tabulated and changes in the frequency with which a particular organism is isolated can now be easily recognised. A detailed virus report is issued each month which includes for each virus the number of infections reported, the laboratory making the identification, and the principal clinical system affected. A major feature of the reconstruction has been the alteration made in the form of recording to enable the reports to be

transferred to punch cards for machine analysis. The findings are now more readily accessible for research—an advantage which will be increasingly useful as results accumulate.

Besides giving details of the organisms identified and brief descriptions of outbreaks, the Communicable Disease Report contains longer reports of incidents of special interest submitted by individual laboratories. These reports have already included a variety of topics such as an outbreak of *S. enteritidis* originating in Vienna, cases of hand, foot and mouth disease, and details of the first influenza outbreaks of the season.

Hitherto the Communicable Disease Report has been available to contributing laboratories only. However, its findings have an obvious interest for medical officers of health and physicians in hospitals for infectious diseases; the various problems involved in a wider distribution of the Report are being considered.

Donald V. T. Fairrie, C.B.E., F.C.A.

On 31 March 1968, Donald Fairrie retired from the office of Secretary to the Board. He was the first to hold that office, to which he was seconded when the Board was set up in 1961; but he had taken a considerable part in our affairs for at least 15 years before that as a member of the Medical Research Council administrative staff.

Donald Fairrie presented one face to all alike: that of a courteous and helpful friend. His equanimity was a notable part of him, and those who were joined with him in the daily tasks of administration very often had good reason to be thankful for it. But another quality endeared him to those who worked most closely with him. He had a passionate belief in the mission of the Public Health Laboratory Service and a great sense of privilege in being able to work for the Service. He never ceased to say how fortunate he counted himself; thus he roused in others the same feelings as he experienced himself.

In June 1966 he was honoured by the conferment of a C.B.E., a well deserved recognition of his services, which brought much pleasure to his many friends in the Service, the Medical Research Council, and elsewhere.

Our good wishes go with him, and to his wife and family, as he turns his gifts and energies to the many activities that still await his attention.

DIRECTORY OF THE PUBLIC HEALTH LABORATORY SERVICE

AS AT 1st OCTOBER, 1968

LONDON	
COLINDALE	N.W.9
Central Middlesex Hospital	N.W.10
Neasden	N.W.10
County Hall	S.E.1
Tooting	S.W.17
Whipps Cross	E.11

DIRECTORY OF THE SERVICE

HEADQUARTERS ADMINISTRATIVE OFFICE

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J. C. Kelsey, M.D., M.C.Path., Dip.Bact. (*Deputy Director of the Service*)
(*see also p.* 33)

CENTRAL PUBLIC HEALTH LABORATORY

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Telegraphic Address: Defender London N.W.9

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J. C. Kelsey, M.D., M.C.Path., Dip.Bact. (*Director: see also p.* 33)
M. T. Parker, M.D., F.C.Path., Dip.Bact. (*Deputy Director: see also p.* 33)
H. L. Lloydbottom, A.H.A. (*Administrator*)
Miss B. H. Whyte, M.A., A.L.A. (*Librarian*)
W. J. Robertson, M.A., Dip.Lib. (*Assistant Librarian*)

CONSTITUENT PUBLIC HEALTH LABORATORIES

Specimens from medical officers of health, general practitioners and others are received, in the first instance, at one of the laboratories listed below.

REGIONAL LABORATORIES

BRISTOL:

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From December 1968
Public Health Laboratory, Myrtle Road, Kingsdown, Bristol, BS2 8EL
Tel.: Bristol (STD 0272) 21326

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C. A. Morris, B.Sc., M.B., Dip.Bact.

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J. Nagington, M.D., Dip.Bact.

CARDIFF:

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(*b*) Public Health Laboratory, Institute of Preventive Medicine, The Parade, CF2 3UJ
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Professor Scott Thompson, M.D., F.R.C.P.E., F.C.Path., D.P.H. (*Director*)
A. D. Evans, M.B., B.Sc., M.C.Path., Dip.Bact.
R. W. S. Harvey, B.Sc., M.D., F.C.Path., Dip.Bact. (*Deputy Director*)

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W. Odrzywolski, M.D.
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Miss M. B. Baillie, M.Sc., Ph.D.
I. D. Farrell, B.Sc.
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H. G. Coles, M.A., B.Sc., A.R.I.C. (*part-time*)
J. E. Cradock-Watson, B.M.
W. M. Darling, M.D.
D. M. Jones, M.D., Dip.Bact.
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J. A. N. Emslie, M.D., Dip.Bact. (*Acting Director to 31st October*, 1968)
J. G. Wallace, B.M., M.C.Path., D.C.P., Dip.Bact. (*Acting Director from 1st November*, 1968)

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L. Hoyle, M.B. (*Director*)

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E. J. G. Glencross, M.B., M.C.Path., Dip.Bact. (*Director*)

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D. A. Skan, M.B.E., M.B., F.C.Path., D.T.M. & H.

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STAFFORD:

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W. Kwantes, M.A., M.B., F.C.Path., Dip.Bact. (*Director*)
Mrs. B. R. Ivey, M.B. (*part-time*)

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* Seconded to the Leprosy Mission, Ethiopia.

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Miss J. Wynne-Jones (Mrs. Bhattacherjee), M.B., M.R.C.S., Dip.Bact.
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M. B. Skirrow, M.B., Ph.D., M.C.Path., D.T.M. & H. (*from 1st November* 1968)

REFERENCE LABORATORIES

These Laboratories normally receive specimens only from other laboratories within or without the Service.

CROSS-INFECTION REFERENCE LABORATORY:

(*incorporating the Staphylococcus and Streptococcus Reference Laboratories*):

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D. C. J. Bassett, M.B., Dip.Bact. (*from November* 1968)
S. Fletcher, M.Sc.
Miss D. R. France, M.Sc.
Miss D. L. Grant, M.A.
J. H. Hewitt, M.Sc.
O. M. Lidwell, D.Phil.* (*Deputy Director*)
W. R. Maxted, F.I.M.L.T. (*Senior Technical Officer*)
J. V. S. Pether, M.A., B.M., M.C.Path., D.T.M. & H., Dip.Bact.
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DISINFECTION REFERENCE LABORATORY:

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DYSENTERY REFERENCE LABORATORY:

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J. D. H. de Sa, M.Sc., Ph.D.
N. D. F. Grindley, B.A.
Miss J. M. W. Griffiths, B.Sc.
Miss J. N. Mayhew, B.Sc.
H. R. Smith, B.A.
A. B. White, M.B., Dip.Bact.
Miss J. N. White, B.Sc., M.A.

LEPTOSPIROSIS REFERENCE LABORATORY:

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SALMONELLA REFERENCE LABORATORY:

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R. J. Gross, B.A.
B. Rowe, M.A., M.B., D.T.M. & H.
Miss E. Woodall, B.Sc.

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VENEREAL DISEASE REFERENCE LABORATORY:

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Miss Y. E. Cossart (Mrs. Wills), M.B., B.Sc., M.C.Path., D.C.P.
J. Craske, M.B., M.C.Path., Dip.Bact.
Miss A. M. Field, B.Sc., Ph.D.
Miss S. D. Gardner, M.B., M.C.Path., Dip.Bact.
J. R. McDonald, F.I.M.L.T. (*Senior Technical Officer*)
Mrs. E. V. Meurisse, M.Sc.
Mrs. M. S. Pereira, M.D. (*Deputy Director*)
Mrs. E. M. Vandervelde, M.B., Dip.Bact.

Note: With the exception of smallpox and related virus diseases, rabies and the serology of typhus fever this laboratory does not receive specimens for routine diagnosis. Such specimens are received at all regional and most area laboratories and enquiries should be directed to the nearest P.H.L.S. laboratory.

COMPUTER TRIALS DEPARTMENT:

Central Public Health Laboratory, Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

S. P. Lapage, M.B., M.C.Path., Dip.Bact. (*Director*)
Mrs. S. Bascomb, M.Sc., Ph.D.
M. A. Curtis, B.Sc.
W. R. Willcox, B.Sc.

EPIDEMIOLOGICAL RESEARCH LABORATORY:

Central Public Health Laboratory, Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

T. M. Pollock, M.B., M.R.C.P.(Glasg.) (*Director*)
Mrs. J. R. Diamond, B.Sc.
W. B. Fletcher, A.M.R., F.S.S.
Miss W. A. Knowles, B.Sc.
J. A. Lee, M.B., D.P.H.
Miss C. L. Miller, B.M. (Mrs. Manning) (*part-time*)
D. L. Miller, M.D., D.P.H. (*Deputy Director*)
Mrs. S. Polakoff, M.B., D.P.H.
D. Reid, M.B.
Miss M. E. M. Thomas, M.B., B.Sc., D.P.H. (*part-time*)
Mrs. E. D. Vernon, B.Sc.

EPIDEMIOLOGICAL RESEARCH UNIT:

86 Dyer Street, Cirencester, Glos.
Tel.: Cirencester (STD 0285) 3745/3330

R. E. Hope-Simpson, O.B.E., M.R.C.S. (*Director, part-time*)
P. G. Higgins, M.D., M.C.Path., Dip.Bact.

FOOD HYGIENE LABORATORY:

Central Public Health Laboratory, Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

Miss B. C. Hobbs, O.St.J., D.Sc., F.C.Path., Dip.Bact. (*Director*)
A. C. Ghosh, B.Sc.
R. J. Gilbert, M.Pharm., Ph.D., Dip. Bact.
Miss D. Roberts, B.Sc.

NATIONAL COLLECTION OF TYPE CULTURES:

Central Public Health Laboratory, Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

S. P. Lapage, M.B., M.C.Path. Dip.Bact. (*Curator*)
L. R. Hill, M.Sc. (*Deputy Curator*)
Miss J. Midgley, B.Sc.
R. J. Owen, B.Sc.
Miss J. E. Shelton, B.Sc.

STANDARDS LABORATORY FOR SEROLOGICAL REAGENTS:

Central Public Health Laboratory, Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

Mrs. C. M. P. Bradstreet, M.B., M.C.Path., Dip.Bact. (*Director*)
Miss E. M. Bailey, B.Sc.
Mrs. M. W. Dighero, B.Sc.
Mrs. J. M. B. Edwards, M.B., M.C.Path. (*Deputy Director, part-time*)
Mrs. G. J. Ellis, B.Sc.
D. R. Fenlon, B.Sc.
Miss A. J. Tannahill, B.Sc.

JUNIOR BACTERIOLOGISTS IN TRAINING

(*Attending course at the London School of Hygiene and Tropical Medicine for Diploma in Bacteriology*)

1967–68

Miss J. Wynne Jones, M.B., M.R.C.S.
A. B. White, M.B.

1968–69

H. W. K. Fell, M.B.
J. C. K. Mills, M.A., M.B.
Miss H. G. Ross, M.B., D.T.M. & H.
Mrs. A. Uttley, M.B., Ph.D.

STAFF ON SECONDMENT

R. Blowers, M.D., F.C.Path., M.R.C.P., Dip.Bact. (*to Makerere University, Uganda*)
P. Cavanagh, M.B., B.A.O., Dip.Bact. (*to London School of Hygiene and Tropical Medicine*)
C. S. Goodwin, M.D., Dip.Bact. (*to Leprosy Mission, Ethiopia*)

Hospital Pathological Laboratories—designated "Recognised"—at which arrangements are made for the examination of public health specimens for the Service

AYLESBURY
Stoke Mandeville Hospital, Aylesbury, Buckinghamshire.
BOLTON
Royal Infirmary, Bolton, Lancashire.
WIGAN
Royal Infirmary, Wigan, Lancashire.

Consultant Bacteriologists employed by Regional Hospital Boards in the Hospital Service, who are associated on a part-time basis with the Public Health Laboratory Service

F. A. J. BRIDGWATER, M.B., M.C.Path., Dip.Bact.
East Birmingham Hospital, Bordesley Green East, Birmingham, 9.
Tel.: Birmingham (STD 021) 772 4021.

T. H. FLEWETT, M.D., B.A.O.
Pathology Department, East Birmingham Hospital, Bordesley Green East, Birmingham, 9.
Tel.: Birmingham (STD 021) 772 4021.

W. L. HOOPER, B.Sc., M.B., M.C.Path., Dip.Bact.
Consultant Bacteriologist to Bournemouth & East Dorset Group of Hospitals, Public Health Laboratory, Poole General Hospital, Poole, Dorset, BH15 1JB.
Tel.: Poole (STD 02013) 5771.

D. N. HUTCHINSON, M.B., Dip.Bact.
Microbiology Department, Royal Infirmary, Meadow Street, Preston.
Tel.: Preston (STD 0772) 57886.

S. I. JACOBS, M.D., M.C.Path.
Bacteriology Laboratory, Monsall Hospital, Newton Heath, Manchester, 10.
Tel.: Manchester (STD 061) Collyhurst 2254.

Miss M. P. JEVONS, M.D., M.C.Path., Dip.Bact.
Group Pathology Laboratories, St. Stephen's Hospital, Chelsea, London, S.W.10.
Tel.: Flaxman (STD 01-352) 8161.

T. D. M. MARTIN, M.R.C.S., F.C.Path.
Department of Pathology, Royal Berkshire Hospital, Reading, Berkshire.
Tel.: Reading (STD 0734)

J. M. MOORE, M.D., M.C.Path.
Bacteriology Laboratory, Doncaster Royal Infirmary, Doncaster, Yorkshire.
Tel.: Doncaster (STD 0302) 2286.

J. M. TALBOT, M.D., M.C.Path., Dip.Bact.
Kingston Hospital Pathological Laboratory, 37 Coombe Road, Kingston upon Thames, Surrey.
Tel.: Kingston (STD 01-546) 9844.

W. R. G. THOMAS, M.B., M.R.C.S., M.C.Path., D.T.M. & H., Dip.Bact.
Bacteriology Laboratory, Mayday Hospital, Mayday Road, Thornton Heath, Surrey CR4 7YE.
Tel.: Thornton Heath (STD 01-684) 6999.

In the following list the name of the expert who is responsible for the relevant examination is given. Reference experts normally receive specimens only from other laboratories within and without the Service. It should be added, however, that all regional and most area laboratories are undertaking the routine diagnosis of virus infections, and that several laboratories are undertaking the serological identification of members of the *Salmonella* group, the serological diagnosis of leptospiral infections, and the bacteriophage-typing of strains of *Staphylococcus aureus*. For this reason enquiries on these subjects should usually be addressed to the local public health laboratory.

Anaerobes, identification

A. T. Willis, M.D., Ph.D., M.C. Path., Public Health Laboratory, Luton and Dunstable Hospital, Lewsey Road, Luton. *Tel.:* Luton (STD 0582) 52007.

Anthrax bacilli, identification

Miss Joan R. Davies, M.D., Dip.Bact., Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, London, S.E.1.
Tel.: Waterloo (STD 01-928) 3467.

Anthrax, examination under Wool and Hair Regulations

T. F. Elias-Jones, M.B., M.C.Path., The City Laboratory, 23 Montrose Street, Glasgow, C.1. *Tel.:* Glasgow (STD 041) Central 9600, *Ext.* 2400.
H. G. M. Smith, M.B., Ph.D., Dip.Bact., Public Health Laboratory, 16–18 Edmund Street, Bradford, 5. *Tel.:* Bradford (STD 0274) 24314.
Miss Joan R. Davies, M.D., Dip.Bact., Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, London, S.E.1.
Tel.: Waterloo (STD 01-928) 3467.

Arboviruses

J. S. Porterfield, M.D., M.R.C.S., L.R.C.P., National Institute for Medical Research, Mill Hill, London, N.W.7. *Tel.:* Mill Hill (STD 01-959) 3666.

Arizona group, identification

Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Brucella, identification

D. J. H. Payne, M.B., F.C.Path., Dip.Bact., Public Health Laboratory, St. Mary's General Hospital, East Wing, Milton Road, Portsmouth, PO3 6AQ. *Tel.:* Portsmouth (STD 0705) 22331.

Cholera and related vibrios, identification

Mrs. K. P. Carpenter, M.B., M.C.Path., Dip.Bact., Dysentery Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel:* Colindale (STD 01-205) 7041.

Clostridium welchii, serological typing

Miss B. C. Hobbs, D.Sc., Dip.Bact., Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale (STD 01-205) 7041.

Coxsackie A viruses

D. R. Gamble, M.B., M.C.Path., Dip.Bact., Public Health Laboratory, West Park Hospital, Epsom. *Tel.:* Epsom (STD 01-39) 26633.

Cytomegaloviruses

H. Stern, M.B., Ph.D., M.C.Path., Virus Department, St. George's Hospital Medical School, Hyde Park Corner, London, S.W.1.
Tel.: Belgravia (STD 01-235) 4343, *Ext.* 147.

Diphtheria bacilli, identification

W. H. H. Jebb, M.D., F.C.Path., Public Health Laboratory, Radcliffe Infirmary, Oxford, OX2 6AH. *Tel.:* Oxford (STD 0092) 49231/2.

Disinfection

J. C. Kelsey, M.D., M.C.Path., Dip.Bact., Disinfection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale (STD 01-205) 7041.

Drug Resistance among Enterobacteria

E. S. Anderson, M.D., F.C.Path., Dip.Bact., F.R.S., Enteric Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Dysentery, amoebic, complement-fixation test for

Mrs. C. M. P. Bradstreet, M.B., M.C.Path., Dip.Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Dysentery bacilli, typing

Mrs. K. P. Carpenter, M.B., M.C.Path., Dip.Bact., Dysentery Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Enteric Fever

(*a*) Serological investigation of suspected cases and carriers.
(*b*) Phage-type determination of strains of typhoid and paratyphoid bacilli, and of *Salmonella typhimurium* and certain other salmonella serotypes.

E. S. Anderson, M.D., F.C.Path., Dip.Bact., F.R.S., Enteric Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Entomological specimens, investigation

B. R. Laurence, Ph.D., Department of Entomology, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.
Tel.: Musuem (STD 01-636) 8636.

Escherichia coli, typing

Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Farmer's lung, serological diagnosis

I. G. Murray, M.B., M.C.Path., D.T.M. & H., Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. *Tel.:* Museum (STD 01-636) 8636

D. G. Davies, M.D., F.C.Path., Dip.Bact., Public Health Laboratory, Cumberland Infirmary, Carlisle. *Tel.:* Carlisle (STD 0228) 23654

J. E. Jameson, M.R.C.S., Public Health Laboratory, Royal Sussex County Hospital, Brighton, 7, BN2 5BE. *Tel.:* Brighton (STD 0273) 63506.

B. Moore, M.D., B.Sc., F.C.Path., B.A.O., Public Health Laboratory, Church Lane, Heavitree, Exeter. *Tel.:* Exeter (STD 0392) 77833.

H. D. S. Morgan, M.R.C.S., M.C.Path., Dip.Bact., Public Health Laboratory West Wales General Hospital, Glangwili, Carmarthen.
Tel.: Carmarthen (STD 0267) 7271.

M. Sussman, Ph.D., M.I.Biol., The Welsh National School of Medicine, Department of Bacteriology, The Royal Infirmary, Cardiff, CF2 1SZ.
Tel.: Cardiff (STD 0222) 33101.

D. M. Weir, M.D., Immunology Unit, Department of Bacteriology, Edinburgh University Medical School, Teviot Place, Edinburgh.
Tel.: Edinburgh (STD 031-667) 1011, *Ext.* 2256.

*Food Poisoning**

Miss B. C. Hobbs, D.Sc., Dip.Bact., Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale (STD 01-205) 7041.

Fungi (*pathogenic*), identification

I. G. Murray, M.B., M.C.Path., D.T.M. & H., Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. *Tel.:* Museum (STD 01-636) 8636.

Helminthological specimens, investigation

Professor G. S. Nelson, M.D., D.Sc., D.T.M. & H., D.A.P. & E., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.
Tel.: Museum (STD 01-636) 8636.

Hydatid disease, complement-fixation test for

Mrs. C. M. P. Bradstreet, M.B., M.C.Path., Dip.Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

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* Owing to the perishable nature of most foodstuffs, material for investigation from outbreaks of food poisoning should normally be sent to the nearest public health laboratory. The reference laboratory should be used mainly for non-perishable articles of food, especially when litigation may arise, and for the identification of strains.

Immunofluorescence

C. E. D. Taylor, M.A., M.D., M.C.Path., Dip.Bact., Central Middlesex Hospital, Park Royal, London, N.W.10. *Tel.:* Elgar (STD 01-965) 5733.

Influenza

L. Hoyle, M.B., Public Health Laboratory, General Hospital, Northampton, NN1 5BD. *Tel.:* Northampton (STD 0604) 34347.

Leptospiral infections

L. H. Turner, M.B.E., M.D., D.T.M. & H., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.
Tel.: Museum (STD 01-636) 8636.

Malaria parasites and other blood protozoa

Professor P. C. C. Garnham, C.M.G., M.D., D.Sc., F.R.S., Imperial College Field Station, Ashurst Lodge, Ascot, Berkshire.
Tel.: Ascot (STD 0990) 22204.

Meningococci, typing

Mrs. C. M. P. Bradstreet, M.B., M.C.Path., Dip.Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Mycoplasma

B. E. Andrews, M.R.C.S., F.C.Path., Dip.Bact., Mycoplasma Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Parasitic infections, serological diagnosis of

D. S. Ridley, B.Sc., M.D., F.C.Path., Department of Pathology, Hospital for Tropical Diseases, 4 St. Pancras Way, London, N.W.1.
Tel.: Euston (STD 01-387) 4411.

Pasteurella pseudotuberculosis

N. S. Mair, M.B., F.C.Path., D.C.H., D.P.H., Dip.Bact., Public Health Laboratory, Groby Road Hospital, Leicester, LE3 9QE.
Tel.: Leicester (STD 0533) 872283.

Plague, investigation

R. J. Henderson, M.D., Public Health Laboratory, Royal Infirmary, Castle Street Branch, Worcester. *Tel.:* Worcester (STD 0905) 25238/9.

Pneumococci, typing of, from epidemics

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Poliomyelitis, marker tests

Miss Y. E. Cossart, M.B., B.Sc., M.C.Path., D.C.P., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale (STD 01-205) 7041.

Protective cabinets

O. M. Lidwell, D.Phil., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale (STD 01-205) 7041.

Protozoological specimens, investigation

Professor P. C. C. Garnham, C.M.G., M.D., D.Sc., F.R.S., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.
Tel.: Museum (STD 01-636) 8636.

Psittacosis, isolation of causative agent

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Rabies, laboratory tests for diagnosis

A. D. Macrae, M.D., M.C.Path., Dip.Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale (STD 01-205) 7041.

Rickettsia

A. D. Evans, M.B., B.Sc., M.C.Path., Dip.Bact., Public Health Laboratory, Institute of Pathology, 3rd Floor, Royal Infirmary, Cardiff, CF2 1SZ.
Tel.: Cardiff (STD 0222) 33101.

Salmonella organisms, typing

Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Smallpox, laboratory tests for diagnosis

A. D. Evans, M.B., B.Sc., M.C.Path., Dip.Bact., Public Health Laboratory, Institute of Pathology, 3rd Floor, Royal Infirmary, Cardiff, CF2 1SZ.
Tel.: Cardiff (STD 0222) 33101.

J. H. Hale, O.B.E., M.D., F.C.Path., M.R.C.P., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE. *Tel.:* Newcastle (STD 0632) 38811, *Ext.* 297.

M. H. Hambling, M.D., M.C.Path., D.(Obst.)R.C.O.G., Dip.Bact., Public Health Laboratory, Bridle Path, York Road, Leeds, 15.
Tel.: Leeds (STD 0533) 645011.

A. D. Macrae, M.D., M.C.Path., Dip.Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale (STD 01-205) 7041.

Professor K. MacCarthy, M.D., F.C.Path., Department of Bacteriology, New Medical School, Ashton Street, P.O. Box 147, Liverpool, L69 3BX.
Tel.: Liverpool (STD 051-709) 6022, *Ext.* 202

Professor N. P. L. Wildy, M.B., M.R.C.S., F.R.S.E., Department of Virology and Bacteriology, The University, Birmingham, 15.
Tel.: Birmingham (STD 021-472) 1301.

Staphylococci, bacteriophage-typing

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9 *Tel.:* Colindale (STD 01-205) 7041.

Streptococci of Group A, typing

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Regional Typing Laboratories

(i) *Northern and South Eastern counties:* Cumberland, Co. Durham, Lancs., Northumberland, Westmorland, Yorks, Dorset, Hants., Kent, London, Surrey, Sussex.

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

(ii) *Eastern Counties:* Beds., Cambs., Derby, Essex, Herts., Hunts., Leics., Lincs., Norfolk, Northants., Notts., Rutland, Suffolk.

Miss J. M. Boissard, M.R.C.S., Public Health Laboratory, Tennis Court Road, Cambridge. *Tel.:* Cambridge (STD 0223) 55526.

(iii) *Western Counties:* Berks., Bucks., Cheshire, Cornwall, Devon, Glos., Heref., Oxon., Salop., Somerset, Staffs. Warw., Wilts., Worcs.

W. H. H. Jebb, M.D., F.C.Path., Public Health Laboratory, Radcliffe Infirmary, Oxford, OX2 6AH. *Tel.:* Oxford (STD 0092) 49231/2.

(iv) *Wales.*

Professor Scott Thomson, M.D., F.R.C.P.E., F.C.Path., D.P.H., Public Health Laboratory, Institute of Pathology, 3rd Floor, Royal Infirmary, Cardiff, CF2 1SZ. *Tel.:* Cardiff (STD 0222) 33101.

Toxoplasmosis

North

G. B. Ludlam, M.D., F.C.Path., D.T.M. & H., D.L.O., Public Health Laboratory, Bridle Path, York Road, Leeds, 15.
Tel.: Leeds (STD 0532) 645011.

South (excluding London)

W. Kwantes, M.A., M.B., F.C.Path., Dip.Bact., Public Health Laboratory, Cockett Road, Swansea, SA2 0FA. *Tel.:* Swansea (STD 0792) 24041.

London

D. G. Fleck, M.D., M.C.Path., Dip.Bact., Public Health Laboratory, St. George's Hospital, Tooting Grove, London, S.W.17.
Tel.: Balham (STD 01-672) 1255.

Trichinosis, examination of rats and pigs

Professor G. S. Nelson, M.D., D.Sc., D.T.M. & H., D.A.P. & E., London School of Hygiene & Tropical Medicine, Keppel Street, London, W.C.1. *Tel.:* Museum (STD 01-636) 8636.

Tubercle bacilli and other mycobacteria

J. Marks, M.D., F.C.Path., M.R.C.P., Dip.Bact., Tuberculosis Reference Laboratory, Institute of Preventive Medicine, The Parade, Cardiff, CF2 3UJ. *Tel.:* Cardiff (STD 0222) 30108.

Regional Centres for Tuberculosis Bacteriology

Bristol: H. R. Cayton, M.B., M.C.Path., Public Health Laboratory, Canynge Hall, Whatley Road, Bristol, BS8 2PR. *Tel.:* Bristol (STD 0272) 38257.

Liverpool: G. C. Turner, M.D., M.C.Path., Public Health Laboratory, 126 Mount Pleasant, Liverpool, LE3 5SU.
Tel.: Liverpool (STD 051-709) 3636/7.

London: C. H. Collins, F.I.M.L.T., Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, Westminster Bridge, London, S.E.1.
Tel.: Waterloo (STD 01-928) 3467.

Manchester: J. D. Abbott, M.D., M.C.Path., Dip.Bact., Public Health Laboratory, Withington Hospital, Manchester, M20 8LR.
Tel.: Manchester (STD 061) Didsbury 2416.

Newcastle: J. B. Selkon, M.B., D.C.P., M.C.Path., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE. *Tel.:* Newcastle (STD 0632) 38811, *Ext.* 297.

Wakefield: L. A. Little, M.B., F.C.Path., Dip.Bact., Public Health Laboratory, Wood Street, Wakefield. *Tel.:* Wakefield (STD 0924) 76961.

Typhus fever, serological tests*

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale (STD 01-205) 7041.

Venereal diseases

A. E. Wilkinson, M.B., M.R.C.S., M.C.Path., Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, Ashfield Street, London, E.1. *Tel.:* Stepney Green (STD 01-790) 3008.

Venereal diseases, Treponemal immobilisation test

A. E. Wilkinson, M.B., M.R.C.S., M.C.Path., Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, Ashfield Street, London, E.1. *Tel.:* Stepney Green (STD 01-790) 3008.

Midlands

P. J. L. Sequiera, M.B., The Central Serology Laboratory, Withington Hospital, West Didsbury, Manchester, 20.
Tel.: Manchester (STD 061-445) 7683.

North

J. H. Hale, O.B.E., M.D., F.C.Path., M.R.C.P., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE. *Tel.:* Newcastle (STD 0632) 38811, *Ext.* 297.

VACCINES AND OTHER IMMUNOLOGICAL MATERIALS OBTAINABLE THROUGH THE PUBLIC HEALTH LABORATORY SERVICE

For the address of P.H.L.S. laboratories *see* pp. 27–35

Typhus Vaccine

Stocks are held by the P.H.L.S. laboratories at:

Birmingham	London (Colindale)
Bristol	Manchester
Cambridge	Newcastle
Exeter	Oxford
Leeds	Sheffield
Liverpool	Cardiff (a)

* The Weil-Felix test can be carried out in all constituent laboratories of the Service, and also in a number of hospital laboratories. Only sera giving a doubtful reaction should be sent to the Virus Reference Laboratory.

Rabies Vaccine

Stocks are held by the P.H.L.S. laboratories at:

Liverpool
London (Colindale)
Newcastle
Cardiff (a)

Anthrax Vaccine

Stocks are held by the P.H.L.S. laboratories at:

Bradford
Liverpool
London (Colindale)

Human immunoglobulin

Immunoglobulin prepared from the pooled plasma of normal healthy adults is obtainable on request from any laboratory of the Service. So far as supplies allow, it is issued for the protection of women in contact with rubella during the first three months of pregnancy. It is also issued for contacts of measles and infectious hepatitis in circumstances of special risk.

In addition to normal human immunoglobulin, a stock of immunoglobulin prepared from the blood of persons recently vaccinated against smallpox is held for the treatment of cases of generalised vaccinia, eczema, vaccinatum, accidental vaccinial infections endangering the eye, and, in special circumstances, for the protection of unvaccinated smallpox contacts. This anti-vaccinial human immunoglobulin may be obtained from the P.H.L.S. laboratories at:

Birmingham
Bristol
Cambridge
Cardiff (a)
Gloucester
Leeds
Leicester
Liverpool
London (Colindale)
Manchester
Newcastle
Oxford
Sheffield

Material for intradermal diagnostic tests

Frei antigen for Lymphogranuloma inguinale, Brucellin for Undulant fever, Trichina antigen for Trichinosis, Hydatid antigen for Hydatid disease, and cat-scratch fever antigen can be obtained from the P.H.L.S. Standards Laboratory, which also issues, to any pathologist, Kveim antigen for sarcoidosis. Enquiries relating to fungal antigens should be addressed to the P.H.L.S. Mycology Reference Laboratory.

Notes on other immunological materials NOT obtainable through the Public Health Laboratory Service:

1. *Antisera for therapeutic use*
   Obtainable through the Hospital Pathological Service.
2. *Yellow fever inoculation*
   A list of centres can be obtained from the Ministry of Health, Alexander Fleming House, Elephant and Castle, London, S.E.1.
3. *TABC, cholera and other vaccines*
   Most of these are available commercially.
4. *Smallpox Vaccine*
   Obtainable from Public Health Departments of Local Authorities (Counties, County Boroughs and London Boroughs).

APPENDIX I

COMMITTEES AND WORKING PARTIES

Food investigation

Chairman and Secretary: J. H. McCoy, M.B., D.P.H.

E. S. Anderson, M.D., F.C.Path., Dip.Bact., F.R.S.
R. W. S. Harvey, M.D., M.C.Path., Dip.Bact.
Miss B. C. Hobbs, D.Sc., Dip.Bact.
W. Kwantes, M.B., F.C.Path., Dip.Bact.
H. D. S. Morgan, M.R.C.S., M.C.Path., Dip.Bact.
H. G. M. Smith, M.B., Ph.D., Dip.Bact.
Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H.
S. Brightwell, M.Sc., D.I.C., A.R.I.C. (*Messrs. J. Sainsbury, Ltd., to give technical advice on trade matters*)
M. Ingram, M.A., Ph.D. (*Low Temperature Research Station*)

Steering Committee on Antibiotic Resistance of Pathogens

Chairman: M. T. Parker, M.D., F.C.Path., Dip.Bact.
Secretary: A. L. Furniss, M.D., Dip.Bact.

J. D. Abbott, M.D., M.C.Path., Dip.Bact.,
E. S. Anderson, M.D., F.C.Path., Dip.Bact., F.R.S.
Mrs. K. P. Carpenter, M.B., M.C.Path., Dip.Bact.
J. C. Kelsey, M.D., M.C.Path., Dip.Bact.
T. M. Pollock, M.B., M.R.C.P.(Glasg.)
Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H.
A. E. Wright, M.D., M.C.Path., D.P.H., Dip.Bact.

Standing Committee on Bacteriological Examination of Water Supplies

Chairman: W. H. H. Jebb, M.D., F.C.Path.
Secretary: L. A. Little, M.B., F.C.Path., Dip.Bact.

G. L. Barrow, M.D., M.C.Path., Dip.Bact.
J. A. Boycott, D.M.
Mrs. J. R. Diamond, B.Sc.
R. D. Gray, M.D., F.C.Path., D.P.H.
J. E. Jameson, M.R.C.S.
J. H. McCoy, M.B., D.P.H.
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.
R. Pilsworth, M.D., Dip.Bact.
J. A. Rycroft, M.B., M.C.Path., Dip.Bact.
A. J. Kingsley Smith, B.M., M.C.Path.
Miss J. M. Watkinson, B.Sc.
R. G. Allen, B.Sc., Ph.D., F.Inst.P. (*Water Research Association*)
F.W. Bunting, M.B.E., M.D., D.P.H. (*Society of Medical Officers of Health*)
N. P. Burman, B.Sc., Ph.D. (*Metropolitan Water Board*)
G. U. Houghton, Ph.D., F.R.I.C. (*South Essex Waterworks Company*)
A. E. Martin, M.D., D.P.H. (*Ministry of Health*)
E. Windle-Taylor, C.B.E., M.A., M.D., F.C.Path., D.P.H. (*Metropolitan Water Board*)

Joint Public Health Laboratory Service/Animal Health Division Standing Advisory Committee

P.H.L.S. Members

E. S. Anderson, M.D., F.C.Path., Dip.Bact., F.R.S.
J. H. McCoy, M.B., D.P.H.
D. J. H. Payne, M.B., F.C.Path., Dip.Bact.

Veterinary Members

W. D. Macrae, M.R.C.V.S., D.V.S.M.
A. B. Paterson, Ph.D., B.Sc., M.R.C.V.S., D.V.S.M., F.R.I.C.
A. J. Stevens, M.A., B.V.Sc., M.R.C.V.S., Dip.Bact.

Advisory Sub-Committee on Application and Report Forms

Chairman: G. T. Cook, M.D., F.C.Path.
Secretary: R. Pilsworth, M.D., Dip.Bact.

Standing Committee on Laboratory Buildings

Chairman: S. T. Cowan, M.D., D.Sc., F.C.Path., Dip.Bact.
Secretary: R. H. Westlake

Advisory Sub-Committee on Laboratory Supplies

Chairman: Miss J. R. Davies, M.D., Dip.Bact.
Joint Secretaries: S. W. H. Aust and A. Waltho

Library Advisory Committee

Joint Chairmen:
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.
Miss B. H. Whyte, M.A., A.L.A.
Secretary: Miss B. H. Whyte, M.A., A.L.A.

Standing Committee on Office Equipment and Methods

Chairman: J. H. Hale, O.B.E., M.D., M.C.Path., M.R.C.P.
Joint Secretaries: S. W. H. Aust and A. Waltho

Standing Committee on Technicians

Chairman: R. J. Henderson, M.D.
Secretary: J. W. Bushell

Working Party on Rubella

Chairman: A. D. Macrae, M.D., M.C.Path., Dip.Bact.
Secretary: D. Reid, M.B., D.P.H.

Mrs. C. M. P. Bradstreet, M.B., M.C.Path., Dip.Bact.
Miss S. K. R. Clarke, M.D., M.C.Path.
Miss A. M. Field, B.Sc.
J. H. Hale, O.B.E., M.D., F.C.Path., M.R.C.P.
M. H. Hambling, M.D., M.C.Path., D.(Obst.) R.C.O.G., Dip.Bact.
D. N. Hutchinson, M.B., Dip.Bact.
W. F. Lane, M.B., M.Sc., F.C.Path., D.P.H.
Miss C. L. Miller, B.M.
H. D. S. Morgan, M.R.C.S., M.C.Path., Dip.Bact.
G. B. B. White, M.R.C.S., M.C.Path., Dip.Bact.
J. E. M. Whitehead, M.B., M.C.Path., Dip.Bact.

Communicable Disease Report Working Party

Chairman: T. M. Pollock, M.B., M.R.C.P. (Glasg.)
Secretary: Mrs. E. D. Vernon, B.Sc.

H. R. Cayton, M.B., M.C.Path.
Miss L. M. Dowsett, M.D., F.C.Path.
W. B. Fletcher, A.M.R., F.S.S.
M. H. Hughes, D.M., M.C.Path., D.T.M. & H., Dip.Bact.
J. C. Kelsey, M.D., M.C.Path., Dip.Bact.
G. J. G. King, M.B., F.C.Path., Dip.Bact.
S. P. Lapage, M.B., M.C.Path., Dip.Bact.
D. L. Miller, M.D., D.P.H.
E. R. Mitchell, M.B., Dip.Bact.
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.
Professor Scott Thomson, M.D., F.R.C.P.E., F.C.Path., D.P.H.
J. O'H. Tobin, B.M., M.C.Path., Dip.Bact.
R. H. Westlake
B. K. Kelly, M.A. (*Medical Research Council Computer Services Centre*)

Working Party on Epidemic Non-Bacterial Gastro-Enteritis

Chairman: B. Moore, M.D., B.Sc., F.C.Path., B.A.O.

Secretary: Miss S. K. R. Clarke, M.D.

G. T. Cook, M.D., F.C.Path.
M. H. Hughes, D.M., M.C.Path., D.T.M. & H., Dip.Bact.
J. E. Jameson, M.R.C.S.
A. D. Macrae, M.D., M.C.Path., Dip.Bact.
D. L. Miller, M.D., D.P.H.
E. R. Mitchell, M.B., M.C.Path., Dip.Bact.
T. D. F. Money, M.B., D.(Obst.)R.C.O.G.
J. O'H. Tobin, B.M., M.C.Path., Dip.Bact.
J. E. M. Whitehead, M.B., M.C.Path., Dip.Bact.
D. C. Ower, M.B., D.(Obst.)R.C.O.G. (*Ministry of Health*)

Working Party on Brucellosis

Chairman: D. J. H. Payne, M.B., F.C.Path., Dip.Bact.

Secretary: J. G. Wallace, B.M., D.C.P., Dip.Bact., M.C.Path.

G. I. Barrow, M.D., M.C.Path., Dip.Bact.
J. A. Boycott, D.M.
Mrs. C. M. P. Bradstreet, M.B., M.C.Path., Dip.Bact.
L. A. Little, M.B., F.C.Path., Dip.Bact.
T. M. Pollock, M.B., M.R.C.P.(Glasg.)
D. Reid, M.B., D.P.H.
L. Robertson, B.M., M.C.Path., Dip.Bact.
Mrs. J. D. Coghlan, B.Sc., Ph.D. (*University of Edinburgh*)

Working Party on Farmer's Lung

Chairman and Secretary: I. G. Murray, M.B., M.C.Path., D.T.M. & H.

Mrs. C. M. P. Bradstreet, M.B., M.C.Path., Dip.Bact.
D. G. Davies, M.D., F.C.Path., Dip.Bact.
J. E. Jameson, M.R.C.S.
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.
H. D. S. Morgan, M.R.C.S., M.C.Path., Dip.Bact.
M. Sussman, Ph.D., M.I.Biol. (*The Welsh National School of Medicine, Dept. of Bacteriology*)
D. M. Weir, M.D. (*Department of Bacteriology, Edinburgh University Medical School*)

Working Parties on Acute Respiratory Virus Infections

(Working in collaboration with the Medical Research Council Working Party)

Group I: Acute Respiratory Virus Infections in General Practice

Chairman: P. G. Higgins, M.D., M.C.Path., Dip.Bact.

Joint Secretaries:
R. E. Hope-Simpson, O.B.E., M.R.C.S.
D. L. Miller, M.D., D.P.H.
D. G. Davies, M.D., F.C.Path., Dip.Bact.

Group II: Acute Respiratory Virus Infections in Retail Shopworkers

Chairman and Secretary: T. D. F. Money, M.B., D.R.C.O.G.

Group III: Acute Respiratory Virus Infections among Children in Hospital

Chairman, Laboratory Group: J. O'H. Tobin, B.M., M.C.Path., Dip.Bact.

Chairman, Clinical Group: Professor S. D. M. Court, M.D., F.R.C.P., D.C.H. (*University of Newcastle*)

Secretary: Miss P. M. Poole, M.D., M.C.Path., B.A.O., Dip.Bact.

Committee and Working Party on Whooping Cough

Chairman: E. H. Gillespie, M.B., F.C.Path.

Secretary: J. D. Abbott, M.D., M.C.Path., Dip.Bact.

Miss A. H. Antonis, M.B.
H. R. Cayton, M.B., M.C.Path.
Miss L. M. Dowsett, M.D., F.C.Path.
J. A. N. Emslie, M.B., Dip.Bact.
J. V. T. Gostling, M.A., M.B., M.R.C.S., M.C.Path.
J. H. Hale, O.B.E., M.D., F.C.Path., M.R.C.P.
R. J. Henderson, M.D.
P. G. Higgins, M.D., M.C.Path., Dip.Bact.
H. H. Johnston, D.Phil.
L. A. Little, M.B., F.C.Path., Dip.Bact.
N. S. Mair, M.B., F.C.Path., D.C.H., D.P.H., Dip.Bact.
E. R. Mitchell, M.B., M.C.Path., Dip.Bact.
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.
D. J. H. Payne, M.B., F.C.Path., Dip.Bact.
Mrs. S. Polakoff, M.B.
T. M. Pollock, M.B., M.R.C.P.(Glasg.)
Miss P. M. Poole, M.D., M.C.Path., B.A.O., Dip.Bact.
H. G. M. Smith, M.B., Ph.D., Dip.Bact.
Miss M. E. M. Thomas, M.B., B.Sc., D.P.H.
Professor Scott Thomson, M.D., F.R.C.P.E., F.C.Path., D.P.H.
G. C. Turner, M.D., M.C.Path.
J. E. M. Whitehead, M.A., M.B., M.C.Path., Dip.Bact.
P. J. Wormald, M.D., M.C.Path.
A. E. Wright, M.D., M.C.Path., D.P.H., Dip.Bact.
Professor R. Cruickshank, C.B.E., M.D., F.R.C.P., D.P.H. (*Department of Social and Preventive Medicine, University of the West Indies, Mona, Kingston 7, Jamaica, West Indies*)
Professor J. P. Duguid, B.Sc., M.D., F.C.Path. (*Bacteriology Department, University of St. Andrews*)
W. N. Dunnet, M.D., D.P.H. (*Ministry of Health*)
T. F. Elias-Jones, M.B., M.C.Path. (*City Laboratory, Glasgow*)
R. R. Gillies, M.D., M.C.Path., D.P.H. (*Bacteriology Department, University of Edinburgh*)
F. T. Perkins, M.Sc., Ph.D. (*Immunological Products Control, Medical Research Council*)
N. W. Preston, M.D., M.C.Path., Dip.Bact. (*Department of Bacteriology and Virology, University of Manchester*)
A. F. B. Standfast, M.A., D.Sc., Dip.Bact. (*Vaccine Department, Lister Institute of Preventive Medicine*)
I. Taylor, M.D., F.R.C.P., D.P.H. (22 *Wales Avenue, Carshalton, Surrey*)
J. F. Warin, M.D., D.P.H. (*Medical Officer of Health, City of Oxford*)
A. M. M. Wilson, B.A., B.M., B.Ch., Dip.Bact., F.C.Path. (*Bacteriology Department, University of Edinburgh*)

Advisory Committee on Viral Reagents

Chairman: Mrs. C. M. P. Bradstreet, M.B., M.C.Path., Dip.Bact.

Secretary: Miss E. M. Bailey, B.Sc.

Miss S. K. R. Clarke, M.D., M.C.Path.
J. V. T. Gostling, M.A., M.B., M.R.C.S., M.C.Path.
P. G. Higgins, M.D., M.C.Path., Dip.Bact.
A. D. Macrae, M.D., M.C.Path., Dip.Bact.
J. O'H. Tobin, B.M., M.C.Path., Dip.Bact.
G. B. B. White, M.R.C.S., M.C.Path., Dip.Bact.

Committee on Infection Risks of Haemodialysis

Chairman and Secretary: B. Moore, M.D., B.Sc., F.C.Path., B.A.O.

Miss Y. E. Cossart, M.B., B.Sc., M.C.Path., D.C.P.
E. H. Gillespie, M.B., F.C.Path.
W. H. H. Jebb, M.D., F.C.Path.
D. M. Jones, M.D., Dip.Bact.
J. C. Kelsey, M.D., M.C.Path., Dip.Bact.
I. G. Murray, M.B., M.C.Path., D.T.M. & H.
Mrs. S. Polakoff, M.B., D.P.H.
G. C. Turner, M.D., M.C.Path.
D. H. D. Burbridge, O.B.E., M.R.C.S., D.P.H. (*Ministry of Health*)
J. C. Coleman, M.B., M.R.C.S. (*Fulham Hospital*)

Working Party on Microbiological Specifications for Food

Chairman: Miss B. C. Hobbs, O.St.J., D.Sc., F.C.Path., Dip.Bact.

G. I. Barrow, M.D., M.C.Path., Dip.Bact.
H. R. Cayton, M.B., M.C.Path.
R. D. Gray, M.D., F.C.Path., D.P.H.
R. W. S. Harvey, B.Sc., M.D., F.C.Path., Dip.Bact.
R. J. Henderson, M.D.
W. L. Hooper, B.Sc., M.B., M.C.Path., Dip.Bact.
H. H. Johnston, D.Phil.
J. H. McCoy, M.B., D.P.H.
P. G. Mann, M.D., M.C.Path., Dip.Bact.
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.
L. Robertson, B.M., M.C.Path., Dip.Bact.
A. J. Kingsley Smith, B.M., M.C.Path.
H. G. M. Smith, M.B., Ph.D., M.C.Path.
Miss M. E. M. Thomas, M.B., B.Sc., F.C.Path., D.P.H.
A. T. Willis, M.D., Ph.D., M.C.Path.

Working Party on Rheumatic Fever in Residential Schools

Chairman: G. B. Ludlam, M.D., F.C.Path., D.T.M. & H., D.L.O.
Secretary: B. T. Thom, M.B., M.C.Path., Dip.Bact.

(Committee in process of formation)

Working Party on the Contamination of Pharmaceutical Products

Chairman: Mrs. J. Taylor, M.B., B.Sc., F.C.Path., D.P.H.

Secretary: W. L. Hooper, B.Sc., M.B., M.C.Path., Dip.Bact.

B. W. Barton, M.B., M.C.Path., Dip.Bact.
B. R. Eaton, M. B., M.C.Path., D.C.H.
E. R. Mitchell, M.B., M.C.Path., Dip.Bact.
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.
M. T. Parker, M.D., F.C.Path., Dip.Bact.
Miss P. M. Poole, M.D., M.C.Path., B.A.O., Dip.Bact.
W. T. Brookes, F.P.S. (*Group Pharmacist, City Hospital, Nottingham*)
J. W. Hadgraft, F.P.S., F.R.I.C. (*Group Chief Pharmacist, Royal Free Hospital, London*)
M. G. Leakey, M.P.S. (*Group Pharmacist, Torbay Hospital, Torquay*)
J. G. Roberts, M.P.S. (*Group Pharmacist, City Hospital, Chester*)
G. Sykes, M.Sc., Hon.M.P.S., F.R.I.C., F.I.Biol. (*Boots Pure Drug Co., Ltd., Nottingham*)
D. L. Thomas, B.Sc., M.P.S., D.B.A. (*Group Pharmacist, Derbyshire Royal Infirmary, Derby*)

APPENDIX II

PUBLICATIONS BY MEMBERS OF THE STAFF OF THE PUBLIC HEALTH LABORATORY SERVICE DURING 1967

AJMAL, M. Characteristics of *Cl. botulinum* type E in laboratory media and their relationship to the behaviour of the organism in food. *University of London, Ph.D. Thesis*, 1967.

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APPENDIX III

AWARDS AND EXTERNAL OFFICES ACCEPTED BY MEMBERS OF THE SERVICE DURING 1967

Dr. E. S. Anderson	Chairman of the International Committee for Enteric Phage Typing.
Dr. R. Blowers	Temporary secondment to the Chair of Medical Microbiology, Makerere University College, Kampala, Uganda.
Dr. J. A. Boycott	Home Office Regional Scientific Adviser.
Mr. R. Brooks	Member of the Joint Committee for Higher National Certificates and Diplomas in Medical Laboratory Technology; Member of the Examining Body (Tissue) and of the Advisory Panel on Virology of the Institute of Medical Laboratory Technology.
Dr. K. Patricia Carpenter . .	Member of the World Health Organisation Advisory Panel on Bacterial Diseases (Enteric Diseases).
Mr. L. R. Hill	Member of the Sub-Committee of the International Association of Microbiological Societies on staphylococcal and micrococci; Member of the Advisory Committee for gram-positive cocci for Bergey's Manual of Determinative Bacteriology.
Dr. Betty C. Hobbs . .	Vice-President of the Association of Public Health Inspectors; Member of the World Health Organisation Expert Advisory Panel on Food Hygiene.
Dr. J. C. Kelsey	Member of the Council of the College of Pathologists; Member of the Medical Research Council Committee on Control of Hospital Infection.
Dr. S. P. Lapage	Convenor of the Microbial Systematics Group of the Society for General Microbiology; Member of the Editorial Board of the Journal of General Microbiology.
Dr. A. D. Macrae	Chairman of the Virology Advisory Panel of the Institute of Medical Laboratory Technology; Member of the World Health Organisation Expert Advisory Panel on Virus Diseases.
Dr. J. Marks	Member of the Medical Advisory Sub-Committee on Tuberculosis and Diseases of the Chest (Welsh Hospital Board); Member of the Management Committee of Cardiff Postgraduate Federation for Diseases of the Chest.
Dr. D. L. Miller	Lecturer in Epidemiology at the Royal Institute of Public Health and Hygiene.
Dr. I. G. Murray	Associate Editor of the journal *Sabouraudia*.
Dr. Marguerite S. Pereira . .	Member of the Medical Research Council Working Party on Acute Respiratory Virus Infections.
Dr. J. B. Selkon	Honorary Secretary and Member of the Council of the British Tuberculosis Association.

Dr. C. E. D. Taylor	..	Examiner for the College of Pathologists; Member of the Council of the Association of Clinical Pathologists; Member of the Medical Research Council Working Party on the Clinical Use of Immunological Reagents.
Dr. Joan Taylor	.. ..	Editorial Representative, Comparative Medicine Section of the Royal Society of Medicine; Chairman of the Advisory Committee on Enteric Bacteria and Yersinia for Bergey's Manual of Determinative Bacteriology.
Dr. G. C. Turner	.. ..	Member of the Advisory Committee on Pathology of Liverpool Regional Hospital Board.

INDEX TO PERSONAL NAMES

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